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The Proposed "Popular" Opera House, Paris.

RECENTLY we gave a description, with plan and section, of the great opera-house "for the million" which a company of gentlemen interested in art are proposing to found in Paris.* The success or failure of such a scheme would be matter of interest beyond its own locality. The attempt to popularise lyric drama, so long (from its costliness) an entertainment for a privileged few, is likely to be made in one way or another on both sides of the Channel before long, and we hope in the end with success. But the project of effecting this by a vast increase of the auditorium, so as to distribute the cost among a greatly-increased number of spectators, appears to us one of dubious success, and likely to lead to a heavy expenditure, without satisfactory result, either in a pecuniary or an artistic point of view.

The promoters and architects of the proposed "Opéra populaire" persuade themselves that by properly considered and specialised construction they can provide that an audience of 9,000 persons (from four to five times the ordinary extent of a theatrical audience) should be able to hear satisfactorily and with pleasure, without any disproportionate increase in the numerical strength of the executants. This is a species of ambition which is continually exciting the mind of the modern architect. Mr. Fergusson, in the appendix to his "History of Modern Architecture," has suggested the provision of a concert-room for 20,000 as a desideratum which ought to be supplied. The Albert Hall (to which reference is made by the French projectors) is a scheme of the same kind. It might be urged with some reason, that if people could really hear and enjoy a performance of this kind at a much greater distance, and in much larger buildings than the average of those built for the purpose, it would have been found out before now. The projectors of the "Opéra populaire" assert that it has been found out long ago, and that we have timidly dropped the model of the antique Greek and Roman amphitheatres, which were a greatly larger sort of building than even what they propose to raise. The Coliseum would contain 110,000 spectators; but it is admitted that spectacle only was in question there. But the Athenian theatres were much larger even than the "Opéra populaire" is intended to be, and "it is incontestable," says our French contemporary, "that there were musicians employed in them"; and the antique theatre, too, was open to the sky, or merely covered in with a curtain, though this latter seems only to have been a later Roman refinement of luxury. The argument, therefore, is that if musical drama of some kind or other could be heard in so large an open theatre by an Athenian audience, *à fortiori* it can be heard in a closed building of less extent by a modern audience, whose powers of hearing are not supposed to be inferior to those of the Greeks. It is admitted that echo in a large closed building creates a difficulty; but that, it is urged, may be obviated by using absorbent instead of reflective materials everywhere except near the origin of the sound; "in place of the surfaces being hard and polished, they must be soft, and garnished with cloth fabrics; or, in a word, instead of mirrors, we must have curtains.

"But, it will be objected, if the sound is absorbed everywhere, the vocal power of the singer would be insufficient to completely satisfy the hearing of so large an audience. This is specious reasoning; but experiment has proved that sound can be conveyed in tubes 5,000 or 6,000 mètres. This has resulted in the establishment, in large administrative institutions, of acoustic communication by tubes, which are not resonant, seeing that they are made of gutta percha. The sound-conveying power of the longest of such tubes is due simply to the manner in which the sound-rays are confined and forced forward in a parallel direction; and we find it is only necessary to speak in a low voice at one end of these tubes to be distinctly heard at the other end. If then our object is to reach distinctly the hearing of a very large audience, it would suffice to arrange that audience along the sides of a tube, and the orator might make himself heard by an almost unlimited number of people."†

It follows from these considerations that in building a theatre for a very large audience, we should have all materials near the origin of sound as reflective and sonorous as possible, and all materials in other parts of the house as indifferent to sound, as un-resounding, as possible; and that the general cubic contents of the auditorium should be reduced to a minimum, in comparison with the space occupied by the audience, so as to approach as nearly as possible to the theoretically favourable conditions of a tube.

So far the *Revue Nouvelle*, speaking in the name of the architects of the new opera-house. The process of reasoning is theoretically logical, but the facts we take to be wrong at both ends of it. In the first place, the comparison with the conditions of the Greek theatre is fallacious and misleading. We know little or nothing positively as to the sort of manner in which the "chorus" of the Greek play was sung or declaimed, or of the nature of the instrumental accompaniment, if any, with which it was enlivened; but, negatively, we may feel absolutely certain that it had nothing in common with modern operatic music. There is no evidence whatever to render probable the existence of an art of music, anything like what we now understand by the term, till long after the Christian era. The Greek drama was a performance of a stately, severe, slow-moving type, restricted to three principal actors and the "chorus," and in all probability, as far as we have grounds for conjecture, the "musical" element in it consisted only of some kind of recitation or intoning on a fixed pitch, which would have the effect of conveying the words further than the ordinary tones of speech. But modern lyric drama is utterly distinct from this; it is a highly involved art, employing a great number and variety of performers, vocal and instrumental, dealing with the most delicate shades of effect and expression, and making use of elaborately interwoven successions of sounds following each other often with great rapidity, and which are liable to interfere with and overlap each other, so to speak, in any interior large enough to give space for a perceptible echo. However the auditorium be enlarged, the velocity of sound is a "constant," which cannot be modified in accordance with the dimensions of the building; and which, with an increased area, becomes increasingly disproportionate to what is expected of it. We do not believe that any contrivance for neutralising one echo or reflection of sound by another (which seems to be the kind of idea which governed the setting out of the curves of the *loges* fronts in the proposed Paris house) could be in the least depended upon. There is the expedient of destroying the resonance, mentioned in our first quotation, by using materials that will absorb sound; but these make a very "dead" house for music, a point of importance in so large an interior. This is to be met, however, by the principle of the tube; that is, by confining the air-space of the auditorium as much as possible so as to concentrate the sound. Now this application of the tube-principle in extending the size of music-rooms was suggested in a paper on the subject of buildings for music read at the Institute of British Architects three years ago,‡ in the course of which it was observed that in all probability a rectangular concert-room, of comparatively narrow area, and where the sound was confined in one direction, might probably be prolonged to a much greater length than such a room generally is, with success, proper provision being made against a return echo from the back of the room. But the amphitheatre form of the "Opéra populaire" can in no respect be likened to the "tube" of the French architect's theory. It is true the roof is kept low; but there is a vast space of air in the centre of the interior in which the sounds would spread and disperse quite uncontrolled or reinforced in any one direction.

The architects are right to keep the roof

* See page 53, *ante*, and illustrations.

† Revue Nouvelle de l'Architecture, December 9, 1875.

‡ Architecture practically considered in Reference to Music. By H. H. Statham. January 20, 1873. Printed in the *Builder*, vol. xxxi., p. 78.

low; but in so large an area this will not do all that is required. The difficulty will probably be just the same as in the Albert Hall, where the sounds of the band, in rapid passages especially, wander about in the most vague and uncertain manner, so that sometimes one-half of a phrase strikes clearly on the ear, and the other half is nearly lost.

The Albert Hall, it is true, wants the trumpet-shaped and sound-reflecting proscenium opening, which would certainly be a point in favour of the French theatre. But, besides the velocity of sound, there is another "constant" to be taken into account in these cases, and that is the power of the human voice; and, to a great extent, we may say, also, of the instruments, most of which have a fixed average power which cannot be much varied. A single voice may be very well heard in a large place such as the Albert Hall, in slow passages, where the sound has time to spread and develop itself. But in rapid passages the case is different; they are confused and blurred, and the effort to render them clear to the audience is a great, and in the end a deleterious strain on the singer's physical powers. And when we come from solo-singing to *ensemble*, both of voices and instruments, the disproportion between the limited powers of the singers and players and the increased size of the area is still more apparent. A mere proportional augmentation of numbers will not meet the requirements of the case. Even were it so, this would not meet the case of the "Opéra populaire," the object of which is to bring opera within reach of the masses by opening performances to a greatly increased auditory at low prices, but with the same expenses as usual. But even putting that out of the question, it is an utter mistake to suppose that mere adding to the number of performers in proportion to the size of the building will result in a proportionate effect. If 100 singers produce a certain effect in a theatre that will seat 2,000, it by no means follows that 400 will produce the same effect in a theatre that will seat 8,000.

At the Handel Festivals a chorus of 4,000 sing to an auditory of 20,000; and very grand the result is in some cases, and very confused and unequal in others. But the 4,000 do not produce anything like the same proportionate effect in power and impressiveness that 400 singers would in a room seating only 2,000. If, instead of increasing the number, we could proportionally reinforce the *timbre* and the travelling power of each individual voice and instrument, then the result would be very different. But as each separate voice and instrument can only be adequately heard at a certain distance, the mere combination of an increased number does not give each greater travelling power. The combined sounds will be heard further, no doubt, than single ones could be, but the many at a distance have not the same distinctness as the few at closer quarters: on the contrary, they mutually blur and interfere with each other, and lose edge and distinctiveness of articulation.

In London we are in a position to form a practical opinion upon the results of so large an area, on modern musical performances, as that which the projectors of the "Opéra populaire" contemplate. They refer to our Albert Hall as an example of what may be done in a place of the size they propose. We are sorry to be compelled to inform them that whatever valuable public use that in many respects remarkable building may ultimately be put to, as a place for music it is a warning, and not an example; and that, too, in spite of a very favourable acoustical construction as far as selection of materials goes. The Albert Hall has in England practically demonstrated the truth of the opinion which M. Gounod has already expressed to the committee of the proposed French opera-house, that real "music" is not possible in such great spaces. The idea which is becoming prevalent of having monster concert-rooms and monster theatres we believe to be an utter mistake, though we are very sorry it is so. If the French committee wish to popularise opera, they had much better make a double theatre on the site proposed, and divide audience and performers between them. They will have a much better result, and quite as good a chance of making it pay. If they, in opposition to the advice of their first musician, and to our experience with the Albert Hall, sink their money in a monster theatre, however scientifically contrived, we much fear that they are preparing loss for themselves, and dissatisfaction and disappointment for their public.

THE GLASS EXHIBITION AT ALEXANDRA PALACE.

THE Exhibition of Stained Glass and other work in glass at the Alexandra Palace, promoted by the Company of Glass-Sellers, and which was referred to by a correspondent in our last, is assuredly a very poor show to be regarded as a representative exhibition of the doings of the art and trade in this country. We took note some time since of an advertised intention to promote such an exhibition, as a matter worthy of attention when the time should come; but the thing appears to have been done in such a hole-and-corner way, and so little effort made to attract any interest in it either, that we imagined the project had fallen through or been postponed. There is nothing, as it is, to make a talk about, or to attract public attention in the collection, which consists of four screens containing specimens of stained and embossed glass, fixed before four of the windows on the west side of the great Hall, and a few tables bearing specimens of glass vessels, ornamental and scientific, and of glass-cutting and painting on glass, &c. There can be no doubt that had an appeal been made, on a wider basis, to the artists and manufacturers in glass throughout the kingdom, a very large, interesting, and (to the public) instructive collection might have been got together, such as might have been something like a rival to the Londesborough collection of arms, at present the only thing worth seeing in the building. As it is, the collection is so small and so entirely destitute of representative character, that it has little value. We may offer a few remarks on the objects exhibited, in part by way of indicating what has been done and what may be done on some other occasion; for there is plenty of room for repeating the attempt on a larger scale and under better management.

The designs exhibited are classed under five heads:—A, church-windows; B, domestic glass in the "modern style," showing flowers, figures, and fruit, &c.; C, glass for public buildings, embossed or etched; D, glass cutting; E, leaded window-glazing. The first screen, commencing from the south end, contains two small mediævalised designs of sacred subjects, showing a somewhat refined treatment, though rather common-place in colour, and with too much blue in them; two designs of similar character occupy the same position on the second screen; they are all too high up to be seen properly or for the designer's or manufacturer's name to be discerned. Four squares of designs for cathedral and antique glass (which latter is, as our correspondent last week correctly reported, written as "*antigul* glass"), and for arrangements of "sheet" and "crown" in leaded patterns, are exhibited by Mr. Cox, and show very good style of work, especially in the white glass arrangements; the others are flat treatment of colour designs in a conventional style. The specialty of what Mr. Cox calls "antique" glass seems to be the artificial roughening of the surface so as to break up the flatness of the colour; this of course tends to greater richness of effect; but why call it by so misleading a name as "antique"? It is not like old glass,—no new glass ever can really be so, because the staining of time cannot really be imitated, even if the precise process and material of the old glass were recovered; and there is no need to excuse it by the precedent of what is old, because a treatment which produces this prismatic roughness of surface is only in accordance with the common sense of the art, which dictates that richness and depth of effect should be aimed at rather than raw and glittering colour through smooth surfaces. The same exhibitor shows a piece of "church glass," which is rich and full in colour. The specimens of "domestic" glass in this screen are not happy; the best in style is a window-blind with an etched profile-portrait of the Laureate in the centre, and the rest of the glass in small square quarries containing devices said to be emblematical of the poet's works, but not distinguished by any happiness of invention; the general treatment, however, is in keeping with the principles of stained glass, as a material for decorative rather than pictorial effect. In this respect the etched panels in black and white by Mr. Connell, who works for Messrs. Heaton, Butler, & Bayne, though showing very good drawing, are out of place on glass. You cannot consistently look through a breaking wave, nor can its freedom of movement and variation of tone and lights be represented by any work that is possible on glass. It is a great pity, as we have repeatedly urged, that designers on glass cannot, once for all, be got to see the futility, on both artistic and practical grounds, of attempting *pictorial* effect. Artistically it is a mistake, because that which is obviously, to the eye, a flat transparent or semi-transparent surface in one plane, cannot be consistently made to appear rounded and solid, and the reflected lights and dark shadows of nature cannot be represented by transmitted light; and, practically, there is the objection, that no methods of working on such a ground as glass are sufficiently tractable in manipulation to give realistic softness and refinement. The result must always be hard and artificial.

On the next screen we noticed a rather good specimen of ecclesiastical design by Messrs. Shrigley & Hunt, of Lancaster; a figure of "The Good Shepherd," with too much of the conventional stiffness supposed to be proper to ecclesiastical stained glass, but good and harmonious in colour (mostly in secondary tones), and with the detail treated in a manner suitable to the material. On the same screen Mr. Snell exhibits a design of the "domestic" class consisting entirely of a medley of animals grouped over the surface, each surrounded by its own leading. The design, which is labelled "one week's work," is probably sent as a test of executive ability rather than as a design; considered in that light, we must compliment Mr. Snell on his ability and spirit as a draughtsman. A study from a lithograph of "A Greek Girl" on the same screen has more refinement than any other of the realistic transparencies, and also shows good drawing. At the top of the third screen are what appear to be the best specimens exhibited; especially a domestic window, with a circular design emblematical of Night in the centre, and the spandrel panels filled with flower and fruit subjects. This is in every respect a good and artistic design, both in style and colour. Next to this are two or three specimens of embossed glass, one of which is a reproduction of Flaxman's beautiful design of "Apollo and Lampetia" (from the *Odyssey*), in a severe and simple style which suits the manner of the drawing, and exhibits also a specimen of the kind of effect in which this mode of execution can be legitimately employed. A portrait head of the Princess of Wales, with a border or margin in rather pronounced Renaissance style, shows, nevertheless, some powerful and effective treatment. All these are placed too high for proper examination or for the names to be read; and application for the authors' names only elicited from the official in charge the curt statement that he "had no orders" to supply this simple piece of information. Below these, and "on the line," are a set of productions bearing the name of Geo. Wilson, and comprising a lake and mountain scene, a big portrait of some moustached civic dignitary, with a gold chain, surrounded by a Renaissance border with pink interspaces, and the whole on a blue ground; there are two or three other things of the same kind, among all of which it is difficult to say which is the most tawdry and vulgar in taste. These, however, seem to occupy the post of honour, and strolling visitors came up, and in our hearing admired and marvelled at them: so much for the education of popular taste promoted by the exhibition. Mr. Peter Fussel exhibits on this screen a long panel of "heraldic" glass, which is very good, and so entirely right and in good taste that we can only wonder to find the same exhibitor's name on some of the very commonplace figure transparencies on the first screen. The fourth screen contains a large head of a semicircular window, with some good points in colour and design, but the semicircular border is very crude and raw in effect. One of the best bits in the collection is a small design by Mr. Cox for ornamental leadwork; conventional foliage arising from a vase, and in which the lead lines form the stem and stalk, and the leaves and flowers are of coloured glass. This opens the question how far the lead lines in glass can be made to form part of the design, in combination with colour. As a general rule, in completely stained windows, the leading is supposed to be, and practically is, lost to the eye, which is entirely directed to the coloured glass in the interspaces. But where colour is only introduced here and there, the leading may, we think, be combined with it, and made to form part of the design, with successful effect; but the colour should be very sparingly introduced, otherwise a confusion between the two must result. In the panel mentioned, the effect would be much better if the colour were confined entirely to the leaves

and blossoms, and the ground of the design left colourless; the patches of colour introduced into it only confuse the eye.

Among the miscellaneous objects forming part of the exhibition is a table of service glass, by Messrs. Barnes, of Birmingham, which shows excellent taste. Some of the decanters and wine-glasses are as artistic in form and in the correct treatment of the material as could be wished. They are, though without colour, a good deal founded on the style of Venetian glass design, the spirit of which is well reproduced by the English manufacturer.

We should be very glad to see on some future occasion a really good and representative exhibition of English glasswork. The present one has evidently been quite mismanaged, or not managed at all, and the result is a collection containing a few good bits (put mostly in bad places) amid a motley assemblage of rubbish.*

FRENCH ARTISANS ON THE CERAMIC ARTS.

Two pamphlets now before us, written by M. Meyer and M. Baylac, respectively represent the opinions prevalent among the working men of Paris and Limoges on the ceramic manufactures of Europe. At least, we may presume that the views expressed by these two intelligent artisans, who were selected as the most able representatives of their craft, will be endorsed by the majority of their working-men readers. As judges of the ceramic arts their experience is limited, when compared to the character of the subject, but they enjoyed the advantage of visiting not merely the International Exhibitions held in France, but also the recent concourse at Vienna. More than this is, of course, necessary before an emphatic verdict can be pronounced; for, in judging the respective merits of national industries, the special advantages or disadvantages of the various localities should be taken into account. The nature of the clays and other materials employed may compel the artist to restrict his imagination within bounds which he need not observe in some other and more propitious district. On the other hand, a neighbourhood gifted by nature with excellent raw materials may not perhaps afford good sources of inspiration to the designers and artists. Thus M. Baylac, who represents the ceramic workers of Limoges, complains bitterly that the industrial centres for the manufacture of French stoneware, porcelain, &c., are situated in the provinces instead of Paris. The artistic excellence of French bronzes, furniture, and jewelry is due, M. Baylac insists, to centralisation of these art-industries in a town which affords so many conveniences for acquiring knowledge and for the cultivation of associations admirably calculated to develop genius. At Limoges the position of the workers is more isolated, and the delegate of this town thus accounts for the fact that the artistic excellence of French bronzes and furniture is more universally recognised than the produce of his own craft.

M. Meyer, the Parisian delegate, does not, however, enter into these considerations; and, being himself more fortunately situated, does not probably realise the disadvantageous position of his provincial fellow workers. Nevertheless he also admits that French ceramic produce has failed to excel in every particular detail, in obtaining that undisputed sway in the markets of the world which other art-industries of France have acquired. Since the Exhibition of 1867 painting on china has made no progress in France; but in what relates more especially to the building trades, considerable improvements have been realised. The manufacture of stoneware, hardware, and glassware has made rapid progress during the last few years; and the facility with which these wares may be used for decorative purposes is better understood. They can be coloured easily with metallic oxides, but it is necessary to mix them with the bulk of the material employed, and they cannot be laid on the surface as with porcelain. The long and painful process employed with the latter material is dispensed with in the manufacture of hardware; and, as really marvellous results are obtained by the most simple means, it is not surprising if this branch of industry has been actively encouraged. There is nevertheless much room still open for improvement in the ceramic arts of France, and notably in the question of apprenticeship. A pupil is placed in a workshop when he is twelve years old. He runs errands and learns merely the manual part of his craft. Drawing, which is the very basis of industrial art, is not taught in any workshop; and, as a rule, children are made to work four or five years without being instructed in the craft to which they are destined. If the pupil chooses, he may add to the fatigue of his day's work by spending the few leisure moments allowed him in the evening at some drawing-school; but these establishments are not sufficiently numerous, nor is he particularly encouraged to frequent them. M. Meyer suggests that the Syndical Chamber, or union of this trade, might undertake to watch over the studies of these children; for they are often articled by incompetent and ignorant parents, and have no means of enforcing the strict observance of the various stipulations inserted in the act of apprenticeship. Of course, students who live near the manufacture of Sèvres may visit the richest of ceramic museums, where they will learn all the more rapidly as the objects are exhibited in a most systematic manner, being assorted according to the locality and manufactory from which they are derived. The library also contains the most varied designs on every style of decoration; and the value of these precious documents is enhanced by the kind advice and assistance so freely bestowed by the chief librarian.

M. Meyer seizes this opportunity of contradicting the assertion contained in the *Gazette des Beaux-Arts* of October, 1871, that a number of these drawings had disappeared during the siege and the Commune. Official documents are quoted which explain how the whole collection was removed to Paris before the arrival of the Prussians. They remained in Paris during the Commune. Two members of the insurrectionary Government and the representatives of the "Federation of French Artists" visited the cellars containing the objects saved from the Sèvres Museum, and, finding that no mischief had been done, caused the doors to be sealed, and they remained untouched and uninjured till the day they were removed back to Sèvres. By technical study which such collections so materially facilitate, real progess will alone be secured, and hence the importance of preserving them. Formerly, when an artisan acquired some reputation he was able to start at least a small business on his own account, and even to found a little museum, in which he infused the artistic spirit that had won him his laurels. Now, however, the character of the industry has entirely changed. Great capitalists are alone able to start manufactures of ceramic ware, and they are consequently worked with a view to financial results, while artistic considerations hold but a secondary place. The proprietor is often but a mere administrator; and, as for the workmen, they are expected to produce a certain amount in exchange for their daily wages, so that they have no time left for studying themselves or teaching the pupils. These facts involve a problem of the utmost importance,—the difficulty of combining business with art. According to the pamphlets before us, more attention seems to have been given to the development of art in England than in France. The French manufacturers, we are told, are entirely absorbed in their efforts to compete with their rivals,—not, however, by endeavouring to improve the quality of their produce, but by reducing the rate of wages. The very opposite policy is adopted in England, where the lucrative wages offered by our great firms entice French workmen to abandon their own country. Thus, at the Exhibitions of Paris and Vienna some of the finest specimens displayed by English manufacturers were due to the skill and taste of the French workmen in their employ. Nor is this all, the presence of French workmen in England has contributed to develop the latent taste of the English artisan, and it is admitted we are able to equal in many points the manufacture of Sèvres.

The Italians on their side are also praised for their hardware and glassware, though it cannot be said that they have made any remarkable progress since the Exhibition of 1867. The Italians monopolise ancient traditions and persist in manufacturing imitations of the antique which would thoroughly deceive even a connoisseur. For work of a more modern style, the Italians have also been glad to enlist the services of French workmen. MM. Rhiel and Alary, two able ceramic artists, for instance, are now working in the factories belonging to Signor Ginori. This firm is more distinguished for its hardware than its porcelain, and it has contracted the bad habit of dissimulating the nature of its products by covering them with a thick layer of colour.

In Austria, the firm of Bernand, which possesses the material formerly belonging to the ancient Imperial Manufactory, produces objects used almost exclusively for architectural decoration. The enamels are well glazed and free from cracks, and are frequently used for the stoves so extensively sold throughout Germany, and also for chimneys communicating from the stove to the wall. Some of these are elaborately decorated, but the colouring is decidedly loud. This firm imitates in its hardware decorations the ordinary French models.

The two chief firms of Denmark seem to be Messrs. Bing & Grandahs, and Messrs. Konigliche, both of Copenhagen. They have distinguished themselves chiefly by the manufacture of immense vases. Many of these works are signed by Judelck Ferensen, a Danish ceramic artist, who possesses undoubted talent. The imperial manufacture of St. Petersburg also prides itself on the dimensions of its vases, &c., but bad taste and unskilled workmanship are clearly discernible. Attempts have been made to apply enamel on glass, and though these efforts have not proved very successful, this is a *début* which promises well for the future. The Russians seem also to be skilled in glass imitations of precious stones, which might prove a useful addition to elaborate fresco-work.

The Imperial manufacture of Berlin is subject to the same criticism which applies to all similar institutions. Its successes are attributed to the subsidy it receives from Government, and the lavish expenditure which such assistance renders possible. Under these circumstances, the production of a few *chefs d'œuvre* hardly exemplifies the prosperity of national industry. For a State as for a private factory, the production of various and good articles extensively consumed by the general public is the true test. When these have been successfully manufactured, then it will be time enough to attempt some more pretentious work. A small object, of trivial value on the market, may demonstrate more conclusively the innate skill and art of the workmen and artists engaged in any particular factory, than some majestic, costly, and elaborate production, only fit to grace the palace of a sovereign. For the welfare of a nation it is better to have art diffused by the cheap articles which all can afford to buy, than confined to the decorations of the mansions of the wealthy. If an object is to be judged by the amount of work expended in its make, it would be difficult to compete with the celebrated "point d'Alençon" robe sent to the Exhibition of 1867. Ten thousand and five hundred days' work were devoted to the making of this marvellous piece of lace, but we are unaware that the country derived any particular benefit from this robe when it was completed, though we do know that the agriculture of France suffered considerably at the time for want of hands. Notwithstanding these various objections, the French critics willingly recognise the virtues and beauty of Prussian ceramic work, though, of course, they do not consider themselves in any danger of serious competition. Indeed, to all French critics at least, France stands first in the ceramic arts, but the second place is unhesitatingly given to England. M. Baylac places Prussia third in the order of merit, Austria fourth, Russia fifth, Denmark sixth, Italy seventh, and Portugal at the end of the list.

In the pamphlets before us there is a lengthy description of the porcelain exhibited at Vienna, and the clays and chemicals usually employed in France, especially at Sèvres; but we have contented ourselves by reviewing the general observations made by these working-men authors. Our readers are mainly interested in the manufactory of porcelain in so far as it helps to spread the general artistic taste of a nation; and we have shown some of the impediments which exist in this respect. With regard to hardware and glass-ware, the case is very different, hence we have dwelt on that section of ceramic work, and reproduced the various opinions expressed by the artisans' delegates, who seem to take so earnest an interest in the more abstract advantages which may accrue from refining and educating the artist workmen engaged in the ceramic manufactures of Europe. The policy they would advocate for art-industries in general is the manufacture of good, handsome, and cheap objects. They rightly maintain that art is not necessarily expensive, and should be

* We have received four letters in reply to our correspondent "An Exhibitor," but the writers were mostly too angry to do their best.

found in the labourer's cottage as in the amateur's gallery. The materials used need not be costly, and the decoration may be as simple as possible, but the original design can always be artistic. To find workmen preaching to their fellow workmen such a moral is a symptom that betokens a prosperous future for art among the artisans of France.

LEAD IN ITS RELATIONS TO ARCHITECTURE.

THAT well-known and highly useful metal which the alchemists, in their fanciful phraseology identified with the planet Saturn, which the Latin races denominate *Plumbum*, and which we plain Anglo-Saxons call *Lead*, bears such important relations to the sciences and arts involved in the theory and practice of architecture, that a repeated study of its properties can never, we hope, come wrong to our readers. Although the subject has been frequently enough treated of in our pages, yet a further discussion, although discursive, may not be undesirable as far as it goes.

One of the earliest metals applied to the arts, we will not say to the purposes of building, lead still retains its well-defined position as the most *ductile* of metals; and even with respect to its formidable rivals, zinc and galvanised iron, it also continues to hold its place in several essential respects. For roofing purposes, indeed, lead is simply invaluable. The stately cathedral roof, the beautiful dome, the minaret, the spire, the finial, are all of them more or less indebted for their effect, as well as preservation, to sheet or cast lead. It may as well be stated, in passing, that the repairs of those leaden roofs have, on several noteworthy occasions, been the unfortunate cause of the destruction of the noble and time-honoured buildings to which they were primarily intended to afford protection. But then we hold this was not so much the fault of the metal,—which does not readily catch fire!—as the fault of the metal-workers themselves, who are apt to neglect their redhot chaffers during a high wind at the dinner-hour. *Festine lente*, we must say to these skilful artisans—hasten slowly when you are about to burn down our cathedrals and crystal palaces!

When we come to the interior fittings connected with a building we shall find that there is not a single principle of water supply or drainage, or even gasfitting and bellhanging, which is not more or less dependent on the applications of this most useful metal. The lining of the cistern,—unwise as this may be,—the supply-pipe, the soil-pipe, the trap, the safe, the waste-pipe, and the overflow-pipe, are all constructed of lead in one form or another; and although it has been recently demonstrated (only too well) that leaden soil-pipes, under certain conditions, become carious and rotten from the long-continued action of sewer gases, yet it must be said again that this is not the fault of the metal, but of the method of fitting it up, as we shall try to explain.

In the arts of interior decoration, too, the presence of lead (although chemically transformed) is still indispensable; for the basis of almost every form of oil paint which decorates our halls and lobbies consists of its carbonates or its oxides,—that is to say, of white lead, red lead, and litharge. Used as a pigment *per se*, in inordinate quantity, and with a menstruum of the oil of turpentine, white lead is certainly one of the most dangerous and deleterious forms of its application. As to the oxides, these are quite innocuous when properly treated, which is a fact that house-painters should take home to themselves.

We have not much to say about the history of the metal. The Chinese have, of course, been familiar with its use and application from time immemorial. But it is remarkable that neither the Egyptians nor the Greeks made much use of it,—unless, indeed, in the form of weights, or, perhaps, as a sort of glaze on their earthenware,—of which we cannot be certain; although the researches of some of the best German analytical chemists would seem to establish this curious circumstance. Nor can we say that the Hebrews dealt much with lead, except in the way of metaphor and poetical trope. For example, Moses makes a simple reference to its ponderousness; Job says that his words should be written "with an iron pen and lead in the rock for ever," which is obviously meant for durability; and so on. Even although lead is incidentally mentioned in that glowing account of the Tyrian commerce which is given by the prophet Ezekiel as being imported, along with silver, iron, and tin, from Tarshish,—that is to say, from Africa,—it never seems to have been a well-known metal among the ancient Hebrews. Rapp, Rosenmüller, Mr. Napier, and other authorities being against us, we still hold the opinion that the ancient Jews preferred gold and silver,—or even iron and brass,—to lead and tin; even as their descendants are supposed to do at the present day! Seriously speaking, the Jews never were, in the best periods of their history,—nor can we say they are at this moment,—in any way distinguished in the arts of metal-working.

The Romans undoubtedly made the most extensive use of the metal. But it is very remarkable that the Romans seem to have been quite unacquainted with the well-known method of soldering the joints of a leaden pipe. At all events, the slender remains of Roman lead-work that have reached the present century show no indications of this beautiful mechanical process. For instance, in bending a leaden pipe to any required angle, an elbow was bored in a solid stone, into which the ends of the adjacent pieces of pipe were securely cemented. The process of soldering, indeed, seems to have originated among the Arabian alchemists in those old weird days when they pottered over their fluxes and amalgams. Be that as it may, there can be no question about the enormous consumption of lead by the ancient Romans, and the readers of Pliny and Vitruvius will find in their pages almost all that we moderns know of its technical applications. We can also ascertain from other sources that lead-mines were wrought by the Romans in several quarters of Great Britain,—chiefly in Wales and Anglesea,—and lead pigs with undecipherable Latin inscriptions have often been found near the ancient and abandoned works.

Vitruvius, in his eighth book, which is devoted to water-supply, gives quite a scientific account of the mode of finding it, together with its different uses and applications. He treats of hot springs, mineral waters, fountains, river and lake water, together with the various modes of conveying it for the supply of a city. The pipes were of lead or terra-cotta, and sometimes, for the sake of economy, of leather. But it is very remarkable, in connexion with the sanitary aspect of this question, that Vitruvius gives the preference to earthenware pipes, on the ground that the water passing through them was the most wholesome.

It was during the Middle Ages, however, that lead first began to assume that important character with regard to architecture that it still maintains. There can be no doubt but leaden roofs were known, although certainly not widely known, as far back as the gardens of Nebuchadnezzar, and the porches of the Latin basilicæ; but it is to the magnificent roofs of our French and English cathedrals that we must look for the best possible type and highest explication of the architectural value and importance of lead. To enter into the details of castings and laying that good old sheet lead on our Mediæval roofs,—to describe how it has stood the storms of centuries, and the havoc of fires and revolutions, will we hope soon afford a proper theme to some of our able archæologists. But we must not attempt to linger upon it in the present connexion: all we need say here further is that the powerful rolling-machine has long superseded the more curious and antique process of casting by hand, in which, by the way, pure metal was of greater consequence than it seems to be nowadays.

The physical properties of lead, which come first in order, need very little description. As everybody knows, it is a bluish-white metal of considerable brilliancy, which soon disappears on exposure to the air, owing to the formation of a thin film of oxide. It is so soft that it may be easily cut with a knife, or may be made to take impressions from a coin or medal; and it leaves a streak upon paper. It may be cast or beaten, or rolled into thin sheets, but in ductility and tenacity it is low in the scale of metals. It is readily fusible at a temperature of about 625°, and at a higher temperature it absorbs oxygen rapidly from the air, and the oxide thus formed volatilises in the form of white fumes. Its specific gravity is 11·4. In process of time it becomes perfectly dark in colour, and hence Pliny designates the metal *Plumbum nigrum* (or dark) in contradistinction to tin, which he termed *Plumbum candidum* (or white).* It is hardly necessary to explain that lead has of course no mineral or chemical relations to the substance vulgarly known as black lead, the proper name of which is *graphite*,* or plumbago.

It is beyond the scope of this paper to enter upon the pure metallurgy of the subject, although that is highly interesting, involving, as it does, one of the most interesting and beautiful processes of the useful arts. We mean the extraction, or rather separation, of silver from lead. Referring the reader who wishes to pursue this subject to Dr. Percy's exhaustive treatise, we may just mention, in passing, that silver to the value of 30,000*l.* or 40,000*l.* sterling, is annually extracted from lead ores in this country alone! The Russian,—that is to say the Lithuanian,—and the Hungarian mines produce more silver roubles than we care at this moment to compute. The reason why the ores of lead invariably contain silver is one of those singular questions which should be treated alongside of the origin of species. You never find tin in lead ores, which is a more probable nexus to all appearance, and you never find silver in tin ores. The mere colour or specific gravity cannot determine the matter, for gold is never found associated with copper, or even with titanium. The proper explanation will doubtless be found in connexion with the laws of chemical attraction, or electrical affinity, or of both; but this subject, as we have hinted, properly belongs to the domain of the scientific naturalist.

To revert to roofing. There can be no doubt whatever but this is the most important purpose to which lead can be applied in relation to architecture. We will not enter upon the question of weight. Scarcely any other material, from felt to balachulish slate, can be mentioned that is not lighter than lead; none of them can in any degree compare with it in the quality of endurance. We remember to have seen a piece of sheet-lead dug from the ruins of Waltham Abbey, but which had obviously belonged to the roof in some form in its original state. Its preservation was very nearly complete, if we excepted a thin film of oxide on both sides, and it seemed to have weighed about 12 lb. to the superficial foot,—a lesson to be taught to some of our modern builders who profess that 4 lb. is a sufficient weight for any roofing purpose whatsoever. In addition to the element of weight there are certain conditions which cannot be overlooked, nor too widely known, which circumscribe the structural necessities of the metal. We refer, in the first instance, to the physical property of its expansion by heat, and contraction by cold. This quality is, of course, common to all the metals, but to none more so than to sheet-lead, which may be exposed to the scorching rays of the sun on a roof during the day, and to a cold equally intense during the night. It is, therefore, a primary necessity that lead should be laid on a roof in such a manner that it can expand and contract freely during changes of temperature; and consequently, without suffering from that well-known phenomenon which goes under the name of "blistering," the invariable end of which is either a crack of the soldered joints, or a rupture of the sheet itself. Indeed, as a rule, soldered lead should never be used on a roof at all, and need not be used if proper care be taken to overlap the seams properly, or to make that well-known connexion which plumbers term a "roll joint," which admits, under necessary limits, of expansion and contraction. This form of joint, we may mention, is equally applicable to the Italian or Pointed style of architecture.

Lead is the most expensive form of roof—indeed, we may say is a co-efficient to that extent of the whole structure—for the roof in this case governs the buttresses, and even the very foundation of the building. Endurance is therefore its principle recommendation—how it compares with zinc or galvanized iron in this respect is too soon to tell. A hundred years hence people will be able to tell something about the distinction and the difference. All we can say in the present day is that zinc is subject to certain electrical influences from which lead is exempt; and that galvanised iron—with which the roofs of our Houses of Parliament are covered—being a sort of hybrid material like vulcanised india-rubber—it is quite impossible to estimate its future and probable value. On the whole, with regard to roofing, we confess an *attachment* to good stout sheet lead. Next to this form of roof the best is of course the ordinary

* Nat. Hist., lib. 34.

* See for some account of this substance an article on the Keswick Pencil Mills, published in our volume for 1867.

slate roof—constructed at the proper angle—where the whole ridges, gutters, valleys, sheets, and aprons are of lead properly laid. In many respects it is less costly, it is more convenient, and it may be made the most picturesque.

Let us now say a few words with regard to lead pipes in relation to buildings. The most ancient, that is to say, the Roman, method of making lead pipes was to turn a sheet of the metal cast to the requisite thickness on a stout timber or iron mandril; and then to fuse or "barn" the edges together by means of a stream of red-hot lead,—poured on the joint through a level channel of clay,—which melted and thus combined the separate edges. This process,—cumbersome, indeed, and sometimes ineffectual,—had long given place to a soldered joint, until in our day it has been resuscitated, as it were, by the use of the oxyhydrogen blow-pipe. But we need hardly tell our readers that both of these old-fashioned methods have been superseded,—first, by the ordinary drawbench; and, secondly, by the hydraulic press,—the last of which is an uncommonly beautiful process, and renders the use of solder altogether unnecessary. This mechanical innovation,—however it may affect the business of the artisan skilled in the use of the copper bolt,—is not altogether a matter for regret. For the objection we made to solder in any form upon roofs applies with still greater force to solder especially in soil-pipes. There is, in that case, a physical action, properly so called; a chemical action and an electrical action. Solder, which is an alloy of lead and tin is, singular enough, more fusible than either, but then it is *harder* than both. Again tin is a very much better conductor of electricity than lead: hence a case of action and re-action, which we need not stay to explain. Once more the solid, liquid, and gaseous matters which separately or in combination go to compose the sewage of our domestic soil-pipes tell differently on the separate metals; and in point of fact we find that soil-pipes invariably give way at the soldered joints. Besides, it must be told that soldering is frequently executed in such a slovenly fashion as to render the interior surface of the joint a sort of serrated ridge of projecting spikes, to the great obstruction of the thoroughfare. For this reason alone the cast-lead syphon trap is preferable to a soldered one. Supply-pipes are of course never soldered excepting at the points of junction in the lengths, and this, the well-known form of plumber's joint, is, when carefully performed, one of the most useful and scientific operations in the whole range of the mechanical arts.

The use of lead in water-cisterns, although in many respects a very convenient application of the metal, is not by any means without danger in a sanitary point of view, and is, therefore, more or less objectionable. Of course, no other material, even slate or cast-iron, can be made so absolutely water-tight. The lead for a cistern is usually cut in three pieces from the sheet,—the bottom and two sides in one,—the two ends separately, soldered together at the vertical corners by the technical process termed "wiping," which is effected by a cloth saturated with grease and a redhot iron. Those who have tried to do this little job, and burnt their fingers at it, as we have done in our hot youth, will better understand than we can describe it. The waste pipes, water-closet valves, hot-water pipes, and so forth, are all attached to the cistern in the same manner; and yet, as we have said, although probably the safest in one respect, it is not the best means of storing water for domestic use, and we will try to explain in a few sentences the reason. Lead pipes, lead cisterns, lead vessels,—in short, lead in any form, used in connexion with water-supply, contains a possible and a very potent element of poison!

Lead is a metal which, as we have pointed out, is peculiarly prone to oxidation; and therefore a study of the combined action of air and water on lead is of great importance, in consequence of the metal being so frequently employed in the construction of cisterns and water-pipes. The true chemical reaction is simply this,—the lead becomes oxidised at the surface, and the water dissolves the oxide; this solution absorbs the carbonic acid of the atmosphere, a film of hydrated oxycarbonate of lead is deposited in silky scales, and a fresh portion of oxide of lead is formed and dissolved, and in this way a rapid corrosion of the metal ensues. This action is materially increased by the presence of some salts, and diminished by the presence of other salts in the water. It is much increased, for example, by the occurrence of chlorides (which, as chloride of sodium, is often present in spring water), and of nitrates and nitrites (which are often present in spring and river waters, from the decomposition of organic matter); while it is diminished, on the other hand, by the sulphates, phosphates, and carbonates, and especially by carbonate of lime, which is an extremely common impurity in spring water. In the latter case, a film of insoluble carbonate of lead is rapidly formed on the surface, and the metal beneath is thus protected from the action of the water. If, however, the water contain much carbonic acid, the carbonate of lead may be dissolved in its turn; and on the whole, considering the dangers which constantly arise from the use of water impregnated with lead, cisterns constructed of slate, or even of cast iron, are far preferable to leaden ones.* This poisonous tendency of the metal is accordingly one of the great problems of water supply, since the purity of the water is the greatest factor of the oxidation, and consequently of the solution, of the metal. It is impossible to interpose, as has been often suggested, any obstacle to this chemical action, such as plates of zinc or layers of sand or lime, for the obvious reason that these preventives need more attention than a hot-air furnace or a gas-meter. Lead pipes, or even composition pipes the basis of which is lead, are decidedly inferior to tin or iron, or even lead which is lined with tin. But we may return to this subject (which is of the gravest importance) on another occasion. We need not dilate on the symptoms of lead-poisoning which, in its worst form, invariably takes the shape of paralysis; but, strange to say, this well-known poison, like arsenic and hydrocyanic acid, has its uses as a curative agent. Taken with proper precaution, the acetate of lead has been, we believe, found beneficial in cases of phthisis and bronchitis.

The gradual deterioration of lead, not as a metal, of course, but as a merchantable commodity, is another subject of very great importance in these days. The fact, we are afraid, is unquestionable. We have two or three specimens of sheet lead before us at this moment, the properties of which, easily ascertained by the facility of cutting with a penknife, are exceedingly diverse. The quality of softness is the highest test of the purity of the metal; and, simple as it may appear, a good architect should never neglect to use this test. Pure lead may be adulterated in various ways, either in the original pigs, or, which is more frequently the case, by being remelted along with zinc parings and other *débris* of the plumber's shop.

If we had to wander beyond the regions of architecture we could easily discourse on the value and importance of lead in the arts. Even in the fine arts, not to speak of its well-known pigments, it has often been used as a substitute for bronze in the casting of statuary, and for the external decoration of Mediæval buildings. Its value as a material for shot is indisputable. Enormous quantities are consumed in Birmingham and Sheffield in the manufacture of pewter, Britannia metal, and similar alloys. We do not know whether we should make much of the subject of leaden coffins any more than the hot cauldrons in which it was the fashion to boil sorcerers and wizards during the Middle Ages. These are subjects which are foreign to our present purpose, and our space is exhausted. One other application, however, we may just allude to. Lead is the basis of the typefounder's materials, hence of our modern methods of printing; and also of the stereotype founder,—therefore, an indispensable accessory to the wonderful Walter printing-machine, which is now astonishing the latter quarter of the nineteenth century.

We must not omit to mention, in a sketch like this, that lead has always been regarded as the most *prosaic* of metals. It has no poetry in its composition like silver and gold, no mythology like iron, nor archæology like copper. This may possibly be due to its physical want of tenacity and elasticity, as well as its colour. But whatever be the reason, this unfortunate metal has been universally used by the poets, from Horace to Sir Walter Scott, as the proper metaphor for dulness and stupidity. Let us take as a single illustration of this curious fact the well-known triplet from "Marmion":—

> "Oh! be thy soul as lead to lead
> Upon its dull destroyer's head!
> A minstrel's malison is said."

Wherefore, although we confess ourselves that to our taste the subject is by no means dull, we had better conclude, in case our readers should suppose that we are getting infected with the Saturnine atmosphere!

* See on this subject Dr. Christison's valuable "Treatise on Poisons," pp. 551, *et seq.*

TRADE UNIONS.

MR. C. H. REW read a paper on this subject at the last meeting of the Civil and Mechanical Engineers' Society. He commenced by giving some statistical information concerning a few of the principal unions. The largest and richest organisation of the kind was the Amalgamated Engineers (including the trades of engineers, machinists, millwrights, smiths, and pattern-makers), which had upwards of 43,000 members, and a fund of over 200,000*l*. It had more than 350 branches in various parts of the world. In the year 1873 eight new lodges were opened, 1,300 members joined its ranks, and 42,000*l*. were added to the funds. Since 1869 there had been a steady increase in numbers and wealth, upwards of 9,000 members having joined, and no less than 125,000*l*. accumulated for the society's objects. The Amalgamated Carpenters and Joiners came next, with 12,800 members, and 30,450*l*. in the fund. The income of this society for the year 1873 was 31,085*l*., of which 566*l*. were spent in replacing tools, 5,865*l*. for the sick, and 3,000 for "trade privileges," including strike-pay, arbitration and conciliation expenses, &c. The Ironfounders' report for the same year showed the number of members to be nearly 12,000, and the funds in hand 49,000*l*. The annual income of the society was upwards of 32,000, and in the first twenty-five years of its existence it paid to its members little less than 500,000*l*. The Boiler-makers' and Iron Ship Builders' Society numbered more than 13,000 members, and had 39,000*l*. From the year 1870 to 1873 the number of members doubled, and its funds increased four-fold. The Miners' National Association had 130,000 members, and funds in hand to the extent of 143,000*l*.; but this was rather a political organisation than a trade-union. Institutions such as these, which had made their mark and stood the test of time, must have at least some good points about them; but there could be no doubt that the recent aggressive action of the trade-unions was altogether a perversion of the proper aims and objects of such societies. A trade-union was, in theory at least, a friendly and mutual benefit society. The chief function of a trade-union should be that of a mutual insurance society for the assistance of any of its members who might happen to be temporarily out of work. Another object of an ideal trade-union should be the provision of relief and pensions to aged and infirm members. Thirdly, it should form a means of intercommunication throughout the trade, and so enable the workmen to know where work was to be had. It should collect information as to the rates of wages and the demand that exists for labour in different parts of the country. The system of payment to a common insurance fund, in order to ensure "out-of-work" pay, and pensions in old age or infirmity, afforded the true remedy against sudden depression in trade and consequent falling-off of wages, and was one of the happiest connecting-links between the trade-union of to-day and the trade guild of the middle ages. It would also have the result, if carried out in its integrity, of raising the quality of work, inasmuch as the old and infirm members would be able to live on the pensions the unions would be able to grant them, instead of having to do cheap and "slop" work for such wages as they could get when they were unable to keep pace with younger men who could demand the highest pay. The rule should be to make each apprentice and young tradesman pay this insurance money in the prime of life, for the benefit of the old and infirm members, feeling sure that when his time came he would have his claim allowed by the next generation of his craft. Mr. Rew then went on to review the official reports of the inquiries of the Royal Commission on Trade Unions in 1867–8–9. The Commissioners remarked on the methods used by the unions to attain their trade objects, one of which was "to limit the number of workmen to be employed, and to repress competition among the workmen themselves," so as to create a monopoly of labour, with its attendant power to command a higher rate of wages, as well as shorter working-hours. The officers of the unions professed to seek to enforce the rules so as to ensure the setting-up of such a standard of work as could be conformed to by the weaker as well as the stronger men, so that all might earn the same wages. The limitation of the number of apprentices was, it was argued, necessary to prevent any overplus of labour, and to keep wages up; but one witness examined before the Commissioners owned that the real reason

was that workmen sought to keep strangers out of their trade, as they could not, if strangers were admitted, introduce their own sons in such numbers and on such terms as they could wish. The unions dictated the proportion of apprentices each master might have at one time; sometimes the rule was one apprentice to five journeymen; sometimes the master must have no more than seven apprentices whatever number of men he might have in the shop. It was further argued that a master ought to pay the journeyman, over and above his regular wage, for teaching an apprentice; although how a journeyman could be earning one wage by working, and another by teaching an apprentice, was a thing that probably only a union man could explain. Another set of rules bore upon the question of piece-work, the existence of rules against which was admitted by all the witnesses. Fines were imposed on members who took it, and, in short, open war had been declared against the practice; for, said the union leaders, "it leads to scamping of work, and tends to break down wages." It was also said that it encouraged men to work long and irregular hours, and to fall into bad habits. But one witness had the fairness to say that this deterioration of work might be guarded against in the selection of the men to whom piece-work was given. On the other hand, it was shown that in the case of some firms, where piece-work was the rule, higher prices were obtained than would otherwise have been the case. There was a practice, chiefly among stonemasons, called "chasing." It was said that employers put the best men at the head of the lines, so as to keep up the speed at which the work was carried on. This was held to be against the good of the trade, as the good workman was doing more work, and helping to get more out of the less expert workman, than was a fair average. So strong had been the power of the unions, that this practice had almost ceased to exist. The number of bricks to be carried at once by a labourer had been fixed at eight, so that a man must not carry ten, even if it would be easily within his strength for him to do so. This regulation was justified by one witness, who said,—"The society considers that it knows the amount of work a man ought to do: a man should not be free to overexert himself." Another form of repressive action was quite common: a mason might not lay a brick, nor a bricklayer bed a stone, nor could one branch of a trade trespass even a hair's breadth on the domains of the other. These were some of the ways in which the unions exerted an indirect repressive influence, the great means of direct action being the strike. Among the larger unions the decision as to the demand, and, failing their concession, as to the strike, was given by the branch committee in whose district the employer to be struck against carried on business. It then had to be confirmed by the central committee, and by a poll of the whole society. No member or body of members was allowed to strike on his or their own responsibility; if they did so strike, the council had power to refuse "strike-pay." All the leading union witnesses examined before the Royal Commission were careful to point out the deliberation given to each proposed strike before it was ordered; but one of them admitted that in certain cases, such as an attempt to lower wages, introduce piece-work, or employ non-union men, a branch might at once strike on its own responsibility, without obtaining the confirmation of the general body. The rule practically amounted to this: that strikes for objects which could be called defensive might be entered upon by branches on their own action, but for offensive and aggressive purposes the formal sanction of the society as a whole was necessary. Mr. Rew then proceeded to detail the arrangements ordinarily made to ensure the success of a strike, such as "picketing." With regard to the Sheffield and Manchester outrages, he said it would no doubt be unfair to regard them as the ordinary acceptation by the trade-union mind of the meaning of "moral suasion"; still, the fact remained that such outrages were one result of trade-union teaching. All trade-unions made more or less profession of having for their main object the insurance of certain benefits in return for regular subscriptions. But this was too often a mere stalking-horse to get money for carrying out trade objects. The carpenters and joiners, for a weekly payment of 1s., promised 12s. per week in case of sickness, a superannuation allowance of 6s. 6d. per week on the average (8s. to 5s.), and a payment at death of 12*l*. It was not too much to say, however, that until money could be spent twice over, these benefits were not and could not be ensured, for out of a total income of 10,487*l*., no less than 6,733*l*. had been spent in management and for non-benefit purposes, as against 1,634*l*. paid for sickness, funeral benefits, and superannuations. These sums were quite irrespective of the further promised benefits in cases of accident, loss of tools, grants for emigration, or in relief of exceptional distress, for which no provision was made in the practical distribution of the funds. It was the "donations to members out of work from causes other than sickness," or, in plain English, "strike-money," that swallowed up the subscriptions nominally paid for purely friendly objects. As a matter of fact, actuaries appointed by the Commissioners found that one of the professedly richest unions required, to meet its total liabilities, and fulfil all its insurance promises, a sum of over a million sterling, equal to a levy of upwards of 33*l*. per member! The question as to whether the action of the unions had had any pronounced effect in raising the rate of wages was one on which the Commissioners were unable to arrive at a decision, or, at any rate, one upon which they did not put forth any formal expression of opinion. Evidence was given to show that wages had risen in trades which had powerful unions, but evidence was also given of trades in which wages had increased 10 or 15 per cent. within a few years without the intervention of unionism. It would appear to be a mere truism that a steady rate of wages, and an ascending scale of increase bearing some proportion to the national increase of wealth, must be of more benefit to the workman than a series of abrupt rises wrung from the masters at the cost of much suffering and loss to all parties. In conclusion, Mr. Rew briefly considered the legal status of trade-unions, and summarised the conclusions arrived at on the whole subject by the Royal Commissioners, laying especial stress on the advisability and practicability of establishing Boards of Conciliation.

THE INSTITUTE OF ARCHITECTS.

THE special general meeting to continue the discussion of the report of the committee on the affairs of the Institute, adjourned from the 10th ult., was resumed on Monday evening last, at the Institute rooms, the attendance being nearly as large, and the proceedings quite as animated, as on the occasion of the former meeting, of which we gave a note (page 52, *ante*). Without transgressing the wishes of the Council by reporting any of the proceedings in detail, we feel ourselves at liberty to say that the important amendment proposed by the oldest member of the special committee, Professor Donaldson, by which all questions of reform were to be limited to the conditions of the existing charter, was eventually carried by a sufficient majority to mark the sense of the meeting; and that Mr. Horace Jones's amendment, of which notice had been given, to refer the Report to the Council to consider and report upon it further to a general meeting, was carried almost unanimously, with a slight alteration in form in order to incorporate in it the sense of Professor Donaldson's amendment. The meeting now stands adjourned for the 7th of February, another Fellow having requested opportunity for the discussion of a further amendment on that of Mr. Horace Jones (which now stands as a substantive motion), with the object of giving the Council some definite expression of opinion to work upon.

Notice has been given of other amendments and resolutions, which may be considered, but the first turning-point of the discussion is past, and we must congratulate the meeting on its result. Whilst fully alive to and fully sympathising with the conviction, in which nearly all the speakers concurred, that the present position of the Institute necessitates some movement for giving renewed vigour and usefulness to its action, we are distinctly of opinion (in spite of the rather blustering tone assumed by one or two young and ardent "reformers") that the Institute could not have done a more suicidal act that to have taken any step involving or presupposing the abrogation of its present charter. It would have been simply cutting away part of its own standing-ground with the certainty of not being able to replace it except at a considerable cost, and the possibility (or probability) of not being able to replace it at all. And we hope that those members of the special committee who appear to feel chagrined and even aggrieved at what they regard as a shelving of their report, will perceive, on consideration, that this is not the case at all, and that, as was pointed out by more than one experienced speaker at the last meeting, the existing charter is by no means, practically, the unelastic and obstructive document which they have considered it to be; and that they will see the desirability of combining cordially for the general good of the Institute and the profession which it represents, with those who fully recognise the value of their labour in preparing the report, and are desirous of turning it to the best possible account.

So far, we think, we may fairly go in commenting on the proceedings of these formally private meetings. And it will be no "breach of privilege," we hope, to add a word in recognition of the admirable manner in which the vice-president, Mr. Whichcord, has presided over discussions, to the successful conduct of which a combination of firmness and good temper on the part of the chairman is essential.

A NEW PUBLIC MARKET AT BRIXTON.

BRIXTON will shortly possess a public market, one of the largest in the metropolis, and of an unusually varied character. A body of capitalists have purchased the vacant land facing Brixton-road, situated between the London, Chatham, and Dover Company's Metropolitan Extension Railway and Shepherd's-lane, their intention being to erect on the site a large and commodious market for the sale of meat, fish, poultry, vegetables, and every description of provisions, and also for the sale of clothing for men and women, whilst one portion of the market space will be specially set apart for the display and sale of articles of furniture. The land upon which the market is to be erected is little short of an acre in extent, and is the site which the School Board a short time ago fixed upon for new Board schools, but which were abandoned in consequence of the strong opposition which was raised as to the suitability of the site.

The architect of the building is Mr. Henry Parsons, of Devonshire-road. The Brixton-road frontage will be 125 ft. in length, and 52 ft. in height. The elevation from the street level to the upper floor windows, will consist altogether of polished granite and plate glass, bold and massive piers, pilasters, and columns supporting the several plate-glass windows. The upper portion of the frontage will be in red Fareham brick, with carved stone dressings, portions of the elevation being relieved and ornamented by brick bands of varied colours. The building will be carried alongside the railway and Shepherd's-lane, to a depth of 250 ft. westward from Brixton-road, the return frontage in Shepherd's-lane to the extent of 60 ft. in depth being uniform with the main Brixton-road elevation, the remaining portion of this side frontage being brick, and plain in character, with long ranges of lofty windows to admit of light to the interior. An ample supply of light will also be obtained from the roof, which will consist to a great extent of glass. The two principal entrances to the market from the Brixton-road frontage, will each be 12 ft. in width, and in addition there will also be entrances from the Shepherd's-lane frontage, and likewise at the rear of the market, which will be more immediately for the accommodation of the vegetable department.

The front portion of the ground-floor, to a depth of 80 ft. from the main entrances, covering an area of about 10,000 superficial feet, will be fitted up as stalls and "shops" as the meat and general provision section of the market, for the sale of butchers' meat, fish, poultry, butter, cheese, bacon, and every other description of provisions, including grocery and what are known as Italian warehouse stores, whilst the principal portion of the remaining part in the rear will form the fruit and vegetable market, and will be approached from the meat market from which it will be divided, through a spacious entrance near the centre.

It will thus be seen that the market is intended to be carried out on a novel and unusually comprehensive scale, embracing the sale not only of food and wearing apparel, but miscellaneous articles in connexion with general domestic requirements. The building, which will involve a large outlay, estimated at between 30,000*l*. and 40,000*l*., is expected to be completed and opened to the public about autumn in the present year.

THE EXCAVATIONS IN OLYMPIA.

THE commission appointed by the German Government for the excavations to be carried on at its expense in Olympia, and to which attention has already been drawn in these columns, intends publishing reports on the progress of those works at certain intervals, according as the extent of the discoveries made may make it desirable. A strictly scientific treatment of the materials already brought to light will naturally follow, the present periodical publications serving merely the purpose of satisfying the great interest manifested in wider circles in the progress of the undertaking. The *Reichs- und Staats-Anzeiger* publishes now the first of these reports, drawn up by Professor Curtius and Baurath (Government surveyor) Adler, including the time from the beginning of the works on October 4 of last year to its close, and containing particulars on the remarkable finds made during that short period. The report says in substance as follows:—

"The gentlemen entrusted by the commission for the excavations in Olympia with the supervision of the works, Herr Dr. Gustav Hirschfeld and Herr Adolf Bötticher (surveyor), arrived on September 12th at Druva, the village nearest the place of excavation, where a house had been erected and furnished for them by the good offices of the German consul at Patras, Herr Hamburger. After the measurement of an area of 115 stremmata, the works were begun on October 4th by the opening of two trenches east and west of the temple fronts towards the bed of the Alpheios, to keep dry the centre of the excavations, the temple district especially, during the rainy season. Besides a few smaller excavations on the shores of the Kladeos, resulting in the discovery of graves and the western boundary wall of the temple district, it was intended to approach by degrees the temple of Jove by deepening and widening the trenches. During those works the Doric entablature of a still unknown building, and tambours of columns, as well as capitals of the temple itself, were met with. The two principal trenches were then connected by a cross trench dug along the north side, and the clearing of the entire ground before the two fronts was next taken in hand with an increased staff of 125 workmen. In the middle of December the important finds were made of which full particulars are now given.

On the 15th of December a male torso of marble, of more than life-size, was found at the south-east corner of the temple, nearly 10 ft. below the surface, which had been inserted in a later dry wall, a work of considerable artistic value, and in all probability a fragment of the statue of Jove, who had been represented in the middle of the eastern gable in a sitting posture. Five days later, near the same place, the workmen came upon a triangular pedestal of marble, with the perfectly preserved dedicatory inscription of the Messenians and Naupactians to Jupiter Olympus, to whom they offer a tithe of their booty. In the third line of the inscription the name occurs of the artist, Paionios, of Mende in Thracia, who adds in the fourth line that in the competition for decorating the pediments of the temple he was declared victor. The next morning a female figure of Pentelican marble, of more than life-size, in two parts, was found, which by the remnants of wings was proved to be Nice (the Roman Victoria, Goddess of Victory), which had stood on the pedestal. The figure measures from the neck to the tip of the foot 5·55 ft.; the drapery, which leaves the left breast exposed, falls over the girdle in short folds. It lies close to the lower part of the body, exhibiting the beautiful forms in full distinctness. The garment swells out behind in a large sweep. Although head and arms are not yet found, the expressive gracefulness and the swelling drapery of the goddess, descending to the earth, excite great admiration. It was at once recognised as the work mentioned by Pausanias in his description of the monuments of Olympia. It is the first piece of sculpture of a Greek master of the fifth century before Christ which has been corroborated by documents.

At the same place several trilateral blocks of marble came to light, belonging evidently to the same pedestal. They bore inscriptions referring to the history of the Messenians; especially one, the subject of which is the award of a disputed frontier district by the Milesians to the Messenians. It is the process known to us by Tacitus' *Annals*, iv., 43.

From that time the discoveries were continuous, and it was not so much a question of looking for treasures, as of raising and preserving them. A colossal male torso was found lying under that of Nice, almost uncut at the back, consequently also from the gable; the elbow of the left arm is wrapped in the drapery which surrounded the lower body. Beneath the latter, again, another colossus is waiting for deliverance.

On the 22nd, the lower part of a recumbent figure was found before the east front, which must have been placed in the left corner of the gable, probably one of the two river gods of which Pausanias speaks. The fragment is hardly above life size, and of excellent workmanship. By the side of it, the same evening, a male torso, and next, at the south-west corner, a female torso, the first sample of the still preserved statues of the western gable, came to light."

Thus far the most important parts of the report, which further speaks of lucky finds (especially a beautiful head of a Satyr, of terra-cotta, life-size) at the foot of Kronos Hill. Later advices announce the discovery of one of the charioteers, and of a male torso; finally, also, the completion of the river god, the upper part of the body and the perfectly-preserved head having been brought to light. In consequence of the rich yield of the excavations, which has exceeded all expectation, the time and power of the two gentlemen superintending the works in Olympia have been so much occupied that they have been unable to describe and value at its proper merit each find. Photographs and casts of the sculpture are to be sent in to the commission as soon as possible.

ON CERTAIN MATHEMATICAL INSTRUMENTS, AND SOME SUGGESTIONS FOR NEW COMBINATIONS.

THE ARCHITECTURAL ASSOCIATION.

AT the ordinary fortnightly meeting of the Architectural Association on Friday evening, the 21st inst., Mr. John S. Quilter, president, in the chair, the following new members were elected, viz., Messrs. Alfred Burr, J. E. Parr, A. Gillespie, R. L. L. Poynter, and R. O. Ellis. It was announced that the visit to the Natural History Museum, South Kensington, deferred owing to inclement weather, would probably be made to-day (Jan. 29). It also was announced that application had been made by the Birmingham Architectural Association to be constituted a branch of, or to become affiliated with, the London Association; and in order to comply with the application notice was given of the proposed new rule, which will be discussed at a special meeting preceding the next ordinary general meeting on February 4, viz.:—

To be Rule XX., inserted between present Rules XIX. and XX.

"Local societies whose rules are in accordance with those of the Association may be admitted as branches thereof, by a resolution of the committee, confirmed by a vote of the Association at an ordinary or special business meeting. Such societies to contribute to the funds of the Association a sum or sums to be agreed upon before the vote sanctioning their admission. Such societies shall elect local officers, who shall have the management of their affairs, subject to the general control of the committee of the Association; and they shall present an annual balance-sheet and report of their proceedings at the first ordinary meeting of each session. Members of such branch societies shall have the same privileges as members of the Association in respect of the prizes, classes, and library connected therewith, and shall have the right to take part in the business of the general meetings by delegates elected by them in the proportion of one delegate for every five (or part of five) members of the branch society. The chairman of a branch society shall, *ex officio*, be a member of the committe of the Association. The representatives of a branch society may vote either personally or by means of voting-papers delivered to the honorary secretaries of the Association not later than twenty-four hours before the meeting at which the votes are to be recorded. The arrangement with any branch society to be terminable at the close of any session by written notice from either association sent not later than the 1st of June."

Mr. F. C. Penrose then lectured "On Certain Mathematical Instruments, and some Suggestions for new Combinations." The lecture was illustrated by a large number of diagrams and instruments, and all present were agreed as to its value. Unfortunately for those not present, and, indeed, for those who had the advantage of hearing it, the lecture, with the exception of a few notes, was not in MS.; in fact, Mr. Penrose said it would have been impossible for him to have put it in MS. The lecture consisted entirely of an involved technical explanation of the diagrams and instruments exhibited, and was, therefore, almost totally unreportable, especially without diagrams in elucidation of the lecturer's remarks. We are, therefore, only able to briefly show the general scope of the lecture. Mr. Penrose said it was not his intention to trouble the meeting with descriptions of any of the ordinary instruments, T-squares and compasses, and drawing-pens, which were so well understood, but his main object would be to endeavour to explain some of the more unusual forms for drawing; for instance, the conic sections, and a few other curves which had interesting properties or great beauty of line. Before mentioning the curve instruments, he called attention to a very useful and ingenious level, by Mr. Bow, of Edinburgh; and the slide-rule, which was not, he thought, used nearly so much as it ought to be. Messrs. Elliott had sent some modern forms of it, but he preferred the old-fashioned 2-ft. slide rule. It might be used for a great variety of purposes. For instance, with it could be obtained at once the proportion of two scales for reducing or enlarging a drawing, and this operation could be performed with one scale only. It was of great use in checking more elaborate calculations. Cube and square roots, and the values of the sines and tangents of angles, might be obtained from it with tolerable accuracy. The amount of error which might be expected in a simple multiplication of two factors was about as 1 in 300, which was near enough for almost any purpose connected with drawing. One could not, in general, reckon on so much accuracy from geometrical methods depending upon the straightness and squareness of the work. Proceeding to the curve-drawing instruments, the lecturer began with the centrolinead, an instrument invented, he believed, by the ingenious Peter Nicholson, whose dictionary was the first which gave any technical information as to building artificers' work, although it had now been superseded by Gwilt's "Encyclopædia." The centrolinead was used for drawing the converging lines in perspective. The blade, when properly bisecting the angle formed by the two arms, pointed invariably to the extremity of the diameter of a circle passing through the two fixed points and the point of intersection of the two arms when the instrument was placed centrally between the two fixed points. It was very easy to adjust the instrument. Supposing it to be requisite that the lines should converge to a point 20 ft. distant, bisect the angle formed by the converging lines, and draw a straight line to the bisecting line, on the margin of the board towards the vanishing point required. On this line, and equidistant from the bisecting line before mentioned, and at convenient distances, fix two points or pegs. Let the distance from the centre to one of the pegs be (say) 5 in. Then obtain this proportion: Let x be the amount of deflection to be given to the arms. Thus, $x = 5 \times 5$ divided by $5 \times 4 \times 12 = \frac{1}{11}$ = about 1-9th of an inch. If the adjustment had been accurately made, the blade of the centrolinead would fall upon the required converging lines exactly. But perhaps it might not prove sufficiently exact, as it was difficult to deal with such small dimensions as 1-9th of an inch. In that case, move the instrument to the upper line, and regulate it by the lower screw-clamp, and then transfer it to the lower converging line and regulate by the upper screw-clamp. Two or three trials of this kind would be sufficient. So much for the centrolinead as used for drawing converging lines. But what was any point upon it doing? The investigation of this was due to the late Mr. Jopling. It was not difficult to see that the point of the blade formed a loop, but the general action would be much better seen by a different form of the same instrument. In this modification of the centrolinead the blade was omitted, and the arms made with each other a right angle. They were also continued both ways, and a pencil was put on the line bisecting the angle formed by the arms. A heart-shaped figure of great beauty, called the cardivide, was the result. Varieties of the same curve were obtained by placing the pencil elsewhere. The conic-sections, however, took the leading place among curves. They might be described by two characteristics. They were the only curves that could be formed by intersecting a cone by planes in any direction. It was immaterial whether the cone be sharp or flat, or what was called a right cone or an oblique cone; no other than ellipse, parabola, or hyperbola, could be got out of it. He did not especially name the circle because it was included amongst the ellipses. The other peculiarity was that if these curves were measured by octangular co-ordinates from two fixed lines, the relation between these co-ordinates will be expressed by the second power or square of the lines in question. From this peculiarity,

the conic sections were called lines of the second order, straight lines being lines of the first order; and there were no simple equations which might not in some way be represented by straight lines, and there were no quadratic equations which might not in some way be represented by a conic section. The conic sections had various properties, much too numerous to be enumerated, and it was by following out one or the other that they might be drawn by instruments. Again, in the ellipse, the ordinates had always a constant ratio to the ordinates of a circle constructed on the axis major. This gave the method of the trammel.

Among the instruments described and exhibited was Peaucellier's parallel, the invention of a French artillery officer, which was first introduced into this country by Professor Silvester. Mr. Penrose said that the celebrated parallel motion invented by Watt was only approximately accurate, although it answered very well for steam-engine work. Peaucellier's parallel motion had two forms, the positive and negative. Mr. Penrose then explained to the meeting how he had himself adapted the mechanism of this instrument to the purpose of the gear of a pump in his own house, and so succeeded in obtaining a pump which worked uniformly at all parts of its stroke. Mr. Penrose also exhibited an instrument of his own invention for drawing the Ionic volute.

In the brief discussion which followed,

Mr. Elphinstone described methods of constructing Peaucellier's cells with cardboard or sheet brass, remarking that he would recommend all who intended to use the instrument to construct it themselves, as they would then understand it more thoroughly.

Mr. Stannus moved a vote of thanks to Mr. Penrose for his description and explanation of the instruments exhibited, some of which were marvellously ingenious inventions. Particularly noteworthy was Mr. Penrose's instrument for drawing the Ionic volute. By those who had been apprenticed to the "Five Orders," the drawing of this volute might be remembered as a species of torture. He agreed with Mr. Penrose in advocating the study of conic sections.

Mr. Aston Webb, in seconding the motion, asked Mr. Penrose whether he had tried his volute-drawing instrument on the line of an actual volute, and, if so, did his instrument describe a line exactly coinciding with the line of the volute. Furthermore, did he think that the Greeks drew their volutes with instruments?

Mr. Penrose, in reply, said he had not yet satisfied himself as to the exactitude of the instrument, but if not quite exact, it gave a very close approximation. As to the latter part of the question, the Greeks drew so many things with instruments, that no doubt they used an instrument for drawing the volute.

There was no further discussion, but at the close of the meeting many of the members availed themselves of Mr. Penrose's additional explanations of the instruments exhibited.

The next meeting will be held on the 4th of February, when Mr. H. H. Statham is announced to read a paper on "Plan as the Basis of Design."

SALE OF LAND AND BUILDINGS IN LINCOLN'S INN.

A SALE took place at the Auction Mart last week of a house and outbuildings on the west side of Lincoln's Inn-fields, together with a large quantity of vacant land adjoining, containing altogether an area of 10,000 superficial feet. The competition was spirited, but before the biddings commenced, the auctioneer was requested by several gentlemen present to explain the nature of certain restrictions, which it subsequently appeared were of a somewhat peculiar nature as regards building on the premises. The sale took place by the direction of the trustees under the will of the late Alderman Copeland, and it transpired that, under the restrictions in question, the purchaser would not be allowed to build on any portion of the land at present not built upon, which compromises 6,000 superficial feet out of the 10,000 feet, the entire area of the property, leaving only 4,000 ft. at present built upon, which can be applied to building purposes. A further restriction prevents the owner from taking down the existing house and premises, and rebuilding them, without the consent of the owner of the adjoining property. The property was described as freehold, and the present annual rental 500*l*. In submitting the property the auctioneer dwelt upon its prospective increased value owing to its proximity to the new law courts now in course of erection, and stating that a property in Lincoln's Inn, close adjoining, containing a little more than 1,300 ft. was recently sold for 6,000*l*. The first offer made was 5,000*l*., which immediately advanced to 7,000*l*., and the biddings rapidly continued until the property stood at 12,000*l*., and it was ultimately sold for 12,800*l*.

THE ARTISANS' DWELLINGS ACT AND THE GRAY'S INN ROAD COURTS.

SIR SYDNEY WATERLOW, speaking at Maidstone, on the 19th inst., referred in deprecatory terms to the action now being taken by the Metropolitan Board of Works under the Artisans' Dwellings Act. He said: The first scheme of improvement propounded in the metropolis was a scheme for pulling down 300 or 400 houses lying between Leather-lane and Gray's-inn-lane, in Holborn, an unhealthy area, consisting of between ten and eleven acres, three-fourths of which the Board propose to pull down. As some evidence of the necessity for this, it is stated that in this small area there are more than 1,000 families living in *single rooms*, and paying for these single rooms from 1s. 6d. to 4s. per week. The houses are very old, approached in too many instances by narrow courts, only from 3 ft. to 6 ft. wide; and in the majority of cases eight or ten families may be found living in each house, built originally to accommodate only one family, and therefore utterly unfitted for the accommodation of so many persons. These houses contain a most mixed population, respectable working people being, not next door, but too frequently in the next room to persons of vicious morals, and frequently criminal character. There is no doubt as to the desirability of this quarter being rebuilt if the health and morality of the inhabitants are to be at all cared for. Those who are watching the operation of this Act of Parliament are therefore not only surprised, but extremely disappointed, to find by the suggested plans for rebuilding, that this degraded condition of occupation is to remain to a great extent unaltered, and that all the evils which arise from families living in single rooms, with conveniences in common, are to be perpetuated in the new buildings. In spite of all that has been said and written upon this subject, the Metropolitan Board propose, by the plans suggested by their engineer and architect, to construct 1,000 single-roomed tenements, on flats, with open balconies, on which are placed the closets and urinals. Sir Sydney then proceeded to urge that in the interests of decency and morality nothing like the present system should be perpetuated, and contended that the working classes, and especially the wives, would gladly pay an increased rent for increased and improved accommodation.

Reference was made to the subject at the meeting of the Metropolitan Board of Works on the 21st inst., when it was resolved that the question be referred to the architect and engineer, and that they be requested at the next meeting of the Board to show how many single-room, double-room, three-room, and four-room tenements there are projected, to supply accommodation for the surplus population.

COTTAGE BUILDING ON THE DULWICH ESTATE.

THERE is a probability of a large number of dwellings for the industrial classes being shortly erected on the Dulwich College estate, in addition to the mansions and other residences for the wealthy, which are springing up so rapidly on various portions of the estate. A company has just been formed, promoted by a number of City merchants and others residing at Dulwich, with the object of purchasing land on different portions of the estate, and erecting cottages of an ornamental character, which it is stated are now much required in the neighbourhood. The capital of the company in the outset is 6,000*l*., in 10*l*. shares. The company has been registered within the last week or two, and we understand that negotiations will immediately be entered into with the governors of the College for acquiring the necessary land for the first block of cottages to be erected. We also learn that the promoters of the undertaking are desirous that the cottages to be built shall harmonise, as far as possible, with the general character of the locality and the houses on the estate, and that they will in all probability be erected under the superintendence of Mr. Barry, the architect and surveyor to the governors of the College.

VENICE.

AT midsummer last year Venice, by holding high holiday on the occasion of the opening of a new dry dock, reminded the world that if she has long been deposed from her proud position as Queen of the Adriatic, and has lost all her political importance, she still retains a fair place as a port and commercial *entrepôt*. But, while she was thus congratulating herself upon her present advantages, her very existence was being threatened. The Venetian lagoons are rapidly being filled by mud; and, if some prompt measures be not taken, she will be left mistress only of a desolate and unhealthy swamp. More than five-and-twenty streams bear their tribute of sand and slime to the canals of the city, of which the Brenta and Novissimo are the most destructive to the lagoon of Chioggia, and the Bondante and Osselin to that of Venice. The port of Chioggia, since 1812, has lost 75 centimètres in depth. Within sixty years the fen has risen to such an extent that where there used to be 1·14 mètre of water, there is now only 0·79 mètre, and before long the marsh will have reduced the depth of water to about 0·30 mètre. Attention has of late been called to the subject, and it is now hoped that the State will provide for the urgent work of keeping back the Brenta to protect the port of Venice. The estimates of the cost of this undertaking amount to 280,000*l*., or about 7,000,000 lire. It is proposed to extend the work over ten years, and to defray it by an annual contribution of 150,000 lire from Venice itself, and 100,000 from the provinces. Italy is still justifiably proud of the fine old city on the sea, as is evidenced by the fact that last year the chamber of deputies voted over a million sterling for deepening and widening the canals, and establishing warehousing docks at the port. The municipal authorities are now engaged in considering the important question of the water supply with greater earnestness than ever. Drinkable water is only obtained by being brought to Venice in large barges from the Continent. For thirty years successive mayors have sought to immortalise themselves by introducing an adequate water supply during their own reign and under their own auspices. Senator Fiornoni, the present holder of the office, has been more than usually active in the matter, and is likely to solve the problem, unless deterred by interested councillors. Several projects have been advanced, chief among them being that of Mr. Ritterbandt, of London, who proposes to sink an artesian well to the depth of 400 yards, and also to lead the waters of the Brenta to Venice by a conduit in masonry under the lagoons, parallel with the railway, and of the length of 4,250 mètres. This would supply the municipality with 300 cubic mètres of water per diem. The result would be a water supply at 60c. per cubic mètre. Mr. Gaerth, of London, is also a competitor.

SOME OLD HOUSES AND THEIR STORIES.

THE ROYAL ACADEMY OF ARTS' FIRST HOUSE.

A WONDERFUL locality to men who cherish memories of dead far-away celebrities, is that otherwise commonplace, uninteresting London thoroughfare, St. Martin's-lane. It is particularly rich in anecdotes connected with celebrated professors of the fine arts, and is specially interesting from the fact that most of the stories associated with its old houses are of artists to whose efforts we owe the rise and ultimate establishment of our Royal Academy of the Fine Arts.

In their days the British fine arts were enduring the contumely and neglect of their miserably-neglected childhood. Painters were for the most part held in a sort of vassalage by mercenary tricksters and dealers, on whose professed judgment the wealthy and noble patrons of art in their ignorance implicitly relied. Their chief fields of employment were in portraiture—then "the only really lucrative branch of art"; in copying old paintings by foreign masters for the decoration of ceilings and staircases in fashionable houses; in designing for the then newly-introduced book illustrations; and commonly in engraving such designs, but most largely in painting those sign-boards which marked the residences of traders and professional people depending upon the general public for support, before the present plan of putting up the names of streets and numbering the houses was commonly adopted. Many of these signs displayed

no little artistic skill and knowledge both in their design and execution. Hogarth painted several. Samuel Wale, one of these founders of the Royal Academy, who was afterwards R.A., and its Professor of Perspective, was a famous sign-painter, and one of his best-known productions of this kind was a whole-length figure of Shakspeare displayed in a gilt frame, supported by ornamental ironwork, outside a public-house at the corner of Little Russell-street, Drury-lane. They led hard, precarious lives, did these old artists; were the favourite butts of all kinds of heartless witlings; were contemned of every class; and were miserably ill-paid for their labours. Dr. Tucker, dean of Gloucester, once said, and that, too, in the presence of Sir Joshua Reynolds, "A pin-maker is a more useful and valuable member of society than Raffaelle"; and the public held the same opinion. Lowndes, the publisher, agreed to give Wale, when he was eminent and could command high prices, no less a sum than eight guineas for his eight page designs to illustrate "Clarissa Harlowe," and being greatly pleased with them, with notable liberality, added an additional guinea to the price. Wilson disposed of "Ceyx and Alcyone" for a pot of beer and the remains of a Stilton cheese. Hogarth, as we described in another of our papers, sold his copper-plate engravings for half-a-crown per poundweight; and Angelo informs us that Joshua, afterwards Sir Joshua Reynolds, painted heads for half-a-guinea each.

A letter published in the *St. James's Chronicle*, of April 25, 1761, says,—"It is a well-known melancholy truth that the tribe of auctioneers, connoisseurs, picture-dealers, brokers, menders, &c., for their divisions of practice are endless, have monopolised the trade of pictures, and, by their authority, interest, and artifices with the great, have made it a matter of ridicule to purchase any modern production, or encourage an English artist. By this craft the leaders of taste of these kingdoms acquire fortunes and credit, whilst many of our painters, men of genius and industry, are absolutely starving." In the *Adventurer*, again, under the date December 5, 1752, we read in a real or supposed artist's letter,—"I am at present but a humble journeyman sign-painter in Harp-alley; for though the ambition of my parent designed that I should emulate the immortal touches of a Raffaelle or a Titian, yet the want of taste amongst my countrymen, and their prejudice against every artist who is a native, have degraded me into the miserable necessity, as Shaftesbury says, 'of illustrating prodigies in fairs, and adorning heroic sign-posts.' However, as I have studied to improve even this meanest exercise of the pencil, I intend to set up for myself, and to reduce the vague practice of sign-painting to some standard of elegance and propriety." Alas! for the excellent intent. Not many years after the appearance of this letter the sign-painter's art received a crushing blow. In the second year of George III.'s reign, sign-boards having so largely increased in size and number that they darkened the narrow streets where they most abounded, and prevented a proper circulation of air, an Act was passed for their removal as public nuisances, which was followed some few years after by another Act to the same effect but more stringently severe, which insured their final departure, and the consequent disappearance of an occupation from which hundreds of unfortunate painters, with their wives and families, had long obtained a mean and precarious but welcome subsistence. About that time advertisements appeared in the daily papers announcing a forthcoming exhibition of curious signs by the brokers and sign-painters of Knaves-acre, Harp-alley, a comical catalogue of which is still extant. The following extract from the *St. James's Chronicle*, of July 20, 1764, is of interest in connexion with the disappearance of London street-signs:—

"My master yesterday sent me to take a place in the Canterbury stage. He said when I came to Charing-cross I should see which was the proper inn by the words on the sign. I rambled about, but could see no sign at all. At last I was told that there used to be such a sign under a little golden cross which I saw at a two pair of stairs window. I entered the yard and found the waiter swearing about innovations. He said that the members of Parliament were unaccountable enemies to signs, which used to show trades; that for his master's part he might put on sackcloth, for nobody came to buy sack. 'If,' said he, 'any of the signs were too large, could they not have limited the size without pulling down the sign-posts and destroying the painted ornaments of the Strand?' On my return I saw some men pulling with ropes at a curious sign-iron, which seemed to have cost some pounds; along with the iron came down the leaden cover to the pent-house, which will cost at least, also, some pounds to repair." *

It was at this time that Foote, the celebrated comedian, in that most interesting of elder play-houses, the little theatre in the Haymarket, introduced in his tea-table entertainment a species of farce which, under the head of "Taste," was intended, he says, "to brand those Goths in science who had prostituted the useful study of antiquity to trifling superficial purposes, and who had blasted the progress of the elegant arts among us by unpardonable frauds and false prejudices." This satirical sketch is so forcibly characteristic of the position, painting, and sculpture were in at the period we write of, that we venture, without apology, to introduce a few extracts from it:—

"Act 1.—Scene 1.—*A Painting Room.*
Enter Boy *with* Mr. Puff.

Carmine.—Let us be private. (*Exit* Boy.) What have you there?

Puff.—Two of Rembrandt's etchings, by Scrape, in May's buildings,—a paltry affair,—a poor ten guinea job; however, a small game—you know the proverb. What became of you yesterday?

Carm.—I was detained by Sir Positive Bubble. How went the pictures? The Guido, what did that fetch?

Puff.—One hundred and thirty.

Carm.—Hum! Four guineas the frame,—three the painting; then we divide just one hundred and twenty-three!"

In the next act the scene is an auction-room, where sham foreign collectors for sham royal personages run up the prices and extol the merits of sham old masters. "Lord Dupe" is the great purchaser here, and at last a picture is put up which is not a sham, and which his lordship is quite willing to purchase on hearing its merits described, until one of the dealers' agents, "Brush," in the interests of the sham works, informs him that, "Lack-a-day, 'tis but a modern performance, and by an Englishman," whereupon the great aristocratic art-patron at once exclaims, "Oh! then, I would not give it house-room."

The British sculptors fared no better than their countrymen, the painters, and Foote showed the victimised "Novice" of the auction enraptured with the fragments of sham antique sculpture, exclaiming, in an outburst of artificial enthusiasm,—"Great! Amazing! Divine! Oh, let me embrace the dear dismembered bust!—a little further off! I'm ravished! I am transported! What an attitude! But then the locks! How I adore the simplicity of the ancients! How unlike the present priggish, prick-eared puppets! How gracefully they fall all adown the cheek!—so decent and so grave, and,—who the devil do you think it is, Brush? Is it a man or a woman?"

John Pye, in his historical sketch called "Patronage of British Art" (1845), says, in illustration of such scenes as Foote so amusingly satirised:—

"The immense wealth that continued to flow in the current of fashion for the acquisition of pictures and other objects of *virtu*, called into action the faculties of a number of ingenious men, adepts in the art of growing rich by flattering the prejudices of the wealthy who sought them; and it is recorded that portrait-painters were sometimes induced by these temptations to dabble in the dealer's art. The spirit of trade was aided by auction-rooms, built in different parts of the town to exhibit and sell by auction *recherché* objects of all kinds. It must be borne in mind that, at that time, sources of rational pleasure and mental improvement, such as in the nineteenth century are afforded to the million by the National Gallery, British Museum, Royal Institution, exhibitions of various kinds, and scientific institutions in all parts of the town, were then only within the reach of the few whose means enabled them to travel": consequently, "sales by auction were the only opportunities within common reach of seeing works of art." And they were consequently crowded with fashionable company, as we may learn from numerous old prints of such places and magazine sketches of the period. At these sales, continues Mr. Pye, "persons who attended to buy and sell again, to commend or decry, as might be, knew well the vast importance attached by the amateur to whatever they said or did, and did not fail to turn their knowledge to good account. Works, unsanctioned by such authority, though they had been the most perfect works of Raffaelle, would not at an auction have produced five shillings; whilst a damaged and repaired old canvas, sanctioned by their praise, found a purchaser and a place in a noble's collection at almost any price."

Under all these circumstances who can wonder that a belief prevailed, both at home and abroad, that Englishmen were by nature unfitted for the study and practice of the fine arts; that the Abbé du Bos, President Montesquieu, and the Abbé Winckelman and others, complacently denied us, as a race, the mental qualities requisite to excel in painting and sculpture? And remembering the absence of all real taste and knowledge of art in the public generally, which was natural enough under such circumstances, who can wonder that English artists, degraded and contemned in exact proportion to their honesty and ambition, grew bitter in their indignation, and often were morbidly savage in the fierce attacks they made upon a system of art-patronage so cruelly unjust, ludicrously false, degrading, and mischievous? "In a country where poverty is infamous," they were amongst the poorest. Many a wretchedly pathetic, and sometimes romantically picturesque, story could be told of the lives they led, and of the natural outgrowth of such lives, in strange and eccentric doings, in recklessly defiant violations of respectable society's ordinary decencies and common customs, in misanthropy, a morbid sensitiveness to praise or blame, and in wild, strange outbreaks of madness or frantic dissipation. Scattered amongst out-of-the-way nooks of neglected literature we have glimpses of their wild doings; but as a class they were too insignificant and contemptible in the eyes of the public to call for any special notice. Walpole took no trouble to ascertain who Hogarth's father was, even when Hogarth's fame employed Walpole's pen. He was described simply and conveniently as the son of some "low tradesman," which, as our readers know, he was not. The "dainty and delicate" Lord Orford scorned to soil the golden buckles of his aristocratic shoes by following the same great painter into scenes of low sensuality; for, as Allan Cunningham says, "Hogarth was no picker of paths," the fact being that, at the period of Hogarth's career alluded to, he had little or no choice of paths, but, like the rest of his unhappy fraternity, took that low walk of life which belonged, as a matter of course, to men of his contemned and discreditable profession. It is true there were some exceptions to this rule amongst a few fashionable portrait-painters who had grown famous and respectable, and comparatively rich, by the practice of their art; but many a fourth and fifth rate portrait-painter would now look down with scorn upon the prices they obtained for even their best works. Hogarth said he received more for his portrait of Garrick as Richard III., executed when his fame was at its highest point, than any English artist had ever before received for a single portrait. The sum of which he was so proud and boastful was 200*l*. For his other and grander paintings he was much worse paid. "Hogarth," says Allan Cunningham, "supported himself by the sale of his prints: the prices of his paintings kept pace neither with his fame nor with his expectations. It is true, also, that we had in those days at least one "great history painter" in Hogarth's father-in-law, Sir James Thornhill, the patronised of royalty, who was appointed "serjeant-painter to the king," and had the privilege of painting "all the royal palaces, coaches, barges, and the royal navy."

Turning for a moment from the painters and sculptors to architects, we find them in no better plight than their brethren of the brush and chisel. Blenheim, erected by Vanbrugh at the order of the Government, as a monument of national gratitude and glory to the Wellington of his day, was ruinous to the architect's peace and purse. The poor starving masons and carpenters clamoured indignantly, and in vain, for their unpaid wages, and the architect at last finished the work with his own money, thereby reducing himself to poverty, although so little was he respected for thus doing that he records how he and his amiable young wife were not permitted by "Old Sarah,"—Marlborough's proud, parsimonious, illnatured, implacable widow,—to go over the castle and park with some titled friends, whom he had brought to see the place; and had to "sit all day long," waiting their return at

* These signs were sometimes enormously heavy. In 1718, the weight of one caused the whole front of a house to fall into Fleet-street, killing the king's jeweller, two young ladies, and a cobbler. The house stood opposite Bride-lane.

the inn. It is true that the cheap, small honour of knighthood was afterwards awarded him, but that was a miserable return for all he had spent and suffered in erecting Blenheim, the last of his buildings. It is easy to conceive what degrading and obscure struggles Gibbs, who designed the portico of St. Martin's Church, would have gone through in England without the Earl of Mar's friendship. You remember the lines of Savage:—

"O Gibbs! whose art the solemn fane can raise,
Where God delights to dwell and man to praise!"

Without Walpole, the great pretender, Kent, who was everything but a great or real artist in either painting, sculpture, architecture, or decorative designing, for he worked in all these, and in many other sections of art, would have found a fate more in keeping with his merits. Again, if a tutor in architecture had not been wanted for a prince who was afterwards George III., it is probable that we should have heard little enough of another of the R.A. founders, the builder of Somerset House, Sir William Chambers, and to this extent only we may agree with the satirical lines in which he was described as,—

"Knight of the polar star, by fortune placed,
To shine the cynosure of British taste:"

which said taste we look for in vain amongst the public it was Sir William's fate to be judged by. Allan Cunningham says of this period,—"We had no fixed laws nor settled rules by which excellence in architecture could be judged: a palace or a church was tried by precedent and by comparison, and unless it happened to resemble something which time had sanctioned, it was pronounced unclassic and barbarous."

The position of engraving as an art may be gleaned from the fact that in all London there were but two print-shops, and these dealt chiefly in foreign prints and portraits.

It can readily enough be seen how a class of men occupying the social position we have roughly indicated, would naturally seek in each other's society the sympathy and fellowship denied them elsewhere. Hence we find the artists congregating regularly at certain coffee-houses and taverns, higher or lower in grade, according to their position and means. The more famous and popular artists had their favourite resort at the Turk's Head, in Gerard-street, Soho, where also amateur and professional actors and literary men most did congregate. They were a wild, drunken, dissipated set, after the fashion of their day, but there are stories of them extant which show how their fellowship went beyond the mere talking and drinking, and had its place in warm hearts amidst kindly feelings. Angelo, for instance, depicts them here on one evening when the news came that a poor journeyman artist of Long-acre who had been living by painting coach-panels had died suddenly, leaving his widow and children destitute. An honest, and perhaps therefore none too rich, lawyer, who was well known as an amateur artist, Theophilus Forrest, put up a petition for the unhappy mother in the public parlour over the chimney-piece, heading it with a subscription of five shillings, and said to the guests:—"I shall open a book here and be widow's clerk, till twelve, when, gentlemen, by your leave, we will close the account."

Straightway the list grew, and the names of future R.A.s figured in it opposite shillings, half-crowns, and crowns. Amongst these were Mortimer, a great *bon vivant*, the friend of Garrick, Sterne, Churchill, Goldsmith, Quin, Malone, and other celebrities of the day, whose studio over the shop of Jemmy Moran, a bookseller, was a popular morning lounge for fashionable people He sat under a brass sconce, reading the *St. James's Chronicle*, and on the appearance of the petition he called for pen and ink, and "began to sketch, with extreme rapidity, groups of monsters, caricature figures, and grotesques upon the margin." He had the reputation of drawing "with greater spirit and grace than any one, not excepting, perhaps, Guercino himself." He continued thus employed, despite the chaffing and joking of his professional brethren, refusing to allow any of the miscellaneous company to see his productions until eleven o'clock, when, rising with the paper in his hand, he began, in clever imitation of a famous auctioneer of his day named Cock:—

"This lot, gentlemen,—this matchless lot,—this unique effort of art, the property of a great amateur (*aside*, of wine and venison), and a renowned connoisseur (in tobacco and punch) is offered to the notice of the *cognos*. It is to be disposed of without reserve. Come, gentlemen, shall I say ten pounds—five—one pound, gentlemen,—yea, even five shillings,—anything for a beginning?"

The company knew their man, and his intention was at once seen and applauded. Another of the future R.A.s, whose picture of the first Royal Academy and Academicians was not very long since republished in the *Graphic*,—

The First House of the Royal Academy, St. Peter's-court, St. Martin's-lane.

Mortimer figures in it,—cries out from the next box,—

"I offare von guinea, mine friend Mortimare."

"Thank you, Zoffany," returns Mortimer; "charity covereth a multitude of sins."

Amidst the laughter that ensues, another voice cries out, "Guinea and a half!" and Zoffany retorts with "Two guineas,"—seriously adding, "'Pon my soul, 'tis peaudiful!" Whereupon comes another bid from Caleb Whiteford of two guineas and a half, and the bidding continues to rise until it stops at five guineas "from," says Angelo, "some good soul whose name, I regret to say, I cannot record." Mortimer, like Reynolds, was one of Hudson's pupils. We can imagine the future R.A.s as they went home through the dark, ill-paved streets, sooner or later, probably later, after midnight, when the auction was over, more jolly and, perhaps, less steady on their feet than usual. Most of them occupied houses or apartments in St. Martin's-lane and Covent-garden, where, over the Piazza, lived Zoffany, who, although born in Germany, called himself an Englishman, because he so truly loved our country. Richard Wilson was Zoffany's near neighbour, and there, too, not long before, had resided Sir James Thornhill, where he opened his academy for young painters in a building adjoining Covent-garden Theatre.

Still lingering amongst the old founders of the R. A., we note what manner of men were some famous artists whose works, despite all modern aids, appliances, and the accumulating experience and knowledge of generations of art students, still so nobly hold their own. We see portly Dick Wilson, as he was familiarly called, sitting gloomy and melancholy in the snug arm-chair by Jack Hamilton Mortimer's comfortable fire-side, full of cynical bitterness, shabby in dress, cruelly neglected, and scarcely able to earn a meal. Mortimer, a tall, handsome, gentlemanly-attired fellow, full of fun and gaiety, stands before him, and a favourite tabby cat, blissfully contented with the warmth, purrs and basks in the rosy glow between. "Come, my old Trojan," says Mortimer, affectionately bending and stroking his hand gently down Wilson's sleeve,—"Come, old boy, I wish I could set you purring like puss there." But poor Dick was metaphorically out in the cold, and purring was hardly to be expected; there was none of pussy's content in him. His heart was full of grief and bitterness. Again, we see Wilson, who was a great lover of books, entering the bookseller's shop in Church-passage, near Covent-garden, on his way to join a snug little dinner party above to which Mortimer has invited him at a time when the two men, although they had little in common beyond their art and its always kindly fellowship, were great cronies. Mortimer, by the bye, painted the figures in that picture of Ceyx and Alcyone, to which we have already alluded.

The dinner-hour comes and goes, the guests are getting impatient, the host is annoyed. No Wilson turns up. The carefully-prepared dinner is spoiling, and a servant is despatched to what afterwards became the Tavistock Hotel, where Wilson's apartments were, who, returning, informs them that the absent guest has locked up his studio, and gone out with the key in his pocket. So the dinner is placed on the table, and the viands duly disappear. Some little time after, the conversation turns on a certain new publication of the day, and the servant, being sent down into the shop below to fetch it, returns saying:—

"Mr. Wilson is reading it, sir; when he has done with it Mr. Moran says it is at your service."

"Mr. Wilson!"

"Yes, sir."

Imagine the surprise and laughter, the rising up of the dinner party, and their hurrying down to the shop in a body, headed by Mortimer and his amiable engaging spouse, for whom Wilson had the deepest respect and affection. Imagine Wilson as much surprised as any there until reminded of the purpose of his visit, which the reading had quite driven from his mind. See them carry his portly figure up the stairs perforce, laughing and chaffing with merciless merriment, vowing that no dinner should he have until he had drunk a goblet of port, and made an apologetical speech. And then the fun of that merry speech, and the jolly social evening which followed. Ah! those bad old days were not all gall and wormwood, and we have few such genial, jovial, boon companions of rich and poor, recognised and neglected, amongst the mildly respectable or stately dignified clubs, studios, and homes of our modern "Sons of St. Luke."

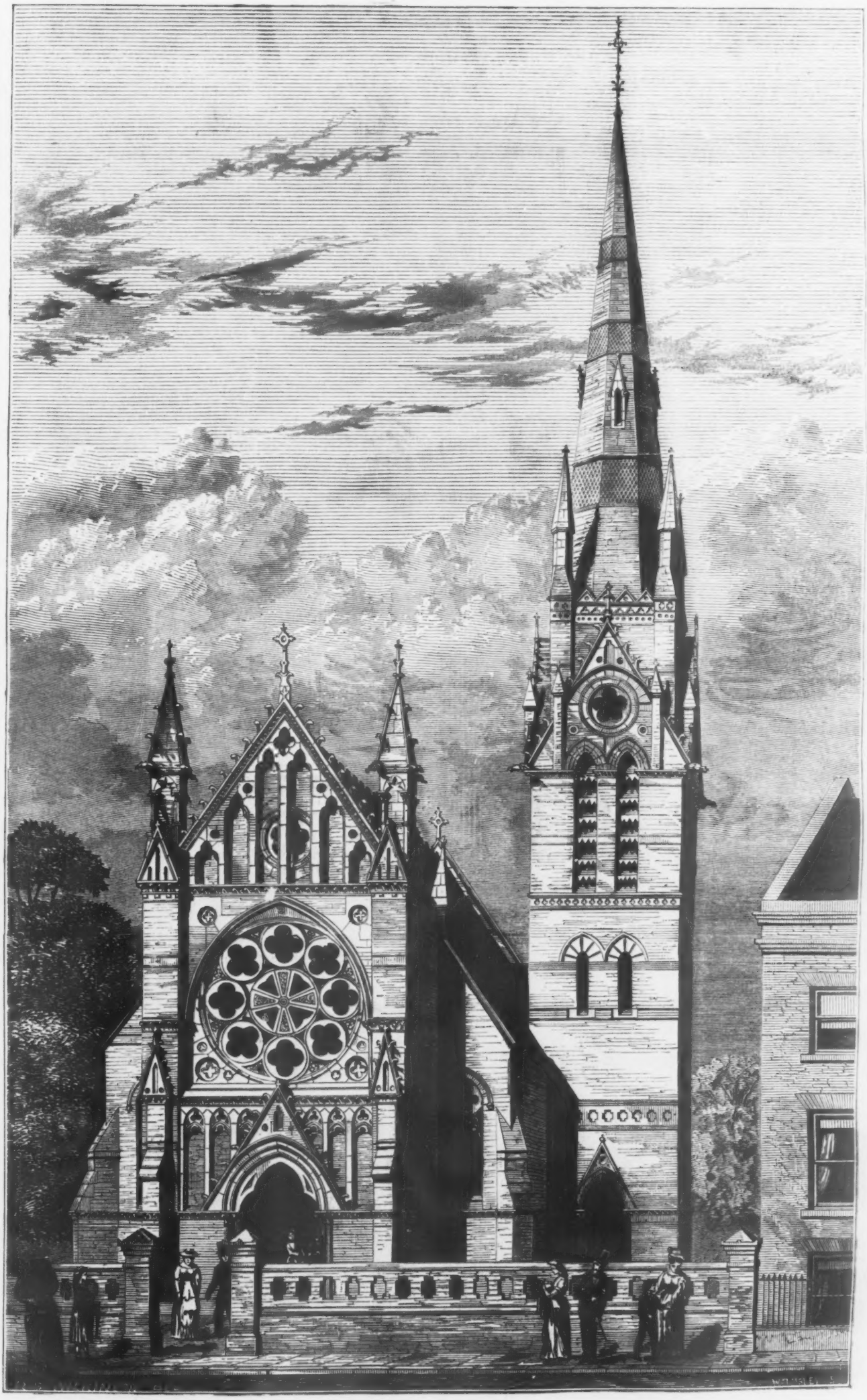
Here, however, we must break off for the present.

THE PUGIN STUDENTSHIP.

THE drawings made by Mr. James Neale, during his tour as the Pugin Travelling Student in 1875, have given general satisfaction, and the Council have awarded to Mr. Neale the 40*l.* to which he became entitled on completion of them. We fully coincide. The drawings are about eighty in number, various in character, and very good indeed. Mr. Neale has won his spurs.

New Hospital at Stroud.—The new general hospital at Stroud has been completed and opened. It has been erected, at a cost of about 7,000*l.*, from plans by Messrs. Medland & Son, architects, Gloucester.

BRONZE DOORS, FOR THE HYPOTHECARY BANK OF BUENOS AYRES.——PRODUCED BY MESSRS. BUNNETT & CO.



THE GERMAN LUTHERAN CHURCH, DALSTON.——MESSRS. E. HABERSHON & BROCK, ARCHITECTS.

BRONZE DOORS, BUENOS AYRES.

IN our last volume we mentioned some bronze-metal doors which had been completed by Messrs. Bunnett & Co. (Limited), New Cross Works, for the Hypothecary Bank of Buenos Ayres. They are all double-leafed, the upper portion being fixed. The size of the largest is 18 ft. 8 in. by 8 ft. 7 in., and the weight of each five tons.

We now give a view of the most important pair, and repeat the particulars before printed.

The design is rich and massive; the thickness of the meeting stile is 10¼ in. The method adopted was to cast each leaf in one plate, only $\frac{3}{16}$ in. thick, the ornamental panels being afterwards secured to it in such a manner that neither screw nor rivet head can be seen from the front, and having the appearance of one casting, enabling the various mouldings to be undercut, and giving to each a clear and sharp outline. The casting of these bronze-metal plates, each about 14 ft. 6 in. long, 4 ft. 6 in. wide, and $\frac{3}{16}$ in. thick, was accomplished in the new foundry each time successfully,—an operation, considering the large size and extreme thinness, necessitating great care and ability.

The doors are hung to the frames by six pairs of hinges to each leaf, with steel washers and pins; and, to prevent any deflection, a gun-metal roller, with steel axle, is fixed under the bottom of the meeting stile, working on a fixed quadrant, and, notwithstanding the immense weight, they can be opened and shut easily by a boy. There are six bolts to each door, which are secured thereto by means of a combination lock from the inside only; the end of each bolt is fitted internally with a steel roller, so that any attempt to cut the bolt would be defeated.

The whole of the enrichment is highly chased, relieved, and burnished, giving a rich appearance. The cost of patterns, models, and enrichment was, of course, considerable, the whole being made from brass patterns.

THE GERMAN LUTHERAN CHURCH, DALSTON.

THIS building, now nearly completed, stands close to the German Hospital at Dalston. Its erection is consequent upon the removal of the Temple founded shortly after the Great Fire of London on the site of the ancient parish church of the Holy Trinity, in Little Trinity-lane. This structure never having been rebuilt after that calamity, the site was purchased, and by the king's letters-patent license was granted on September 13, 24 Car. II., to Theodore Jacobson and five others, to build a Temple on the site for the free exercise of the Augustan Confession in the German tongue. The licence is also to their heirs and assigns, and with the consent of the then Archbishop of Canterbury, the Bishop of London, and the Lord Mayor. The building at that time erected on the site was a plain brick structure with a small cupola over the entrance. It had galleries, and the end of the building was adorned with a handsome altar-piece, an organ-case, and other fittings carved in oak in very elaborate style, having, it is said, all the appearance of Grinling Gibbons's workmanship. The site being required for the purposes of the Metropolitan Railway, it was purchased by the company, and the building was shortly after entirely removed.

The new church has been built mainly through the exertions of Mr. R. Brandt, with Baron Schroeder and the other trustees. It is of brick, in the old Germanic Gothic style, and consists of a nave, chancel, and transepts, and has a tower and spire between the transept and nave on the south side, while a corridor on the north side will enable the convalescent patients from the adjacent hospital to obtain ready access. The principal entrance is from the Alma-road, and beneath a rose-window, which is the most prominent feature of the front. The seats are of oak, and provision is made for about 300 worshippers. The roof of the nave and transepts is of open timber, and that of the chancel is arched and boarded. The church is 79 ft. 6 in. long internally, the nave is 28 ft. 3 in. wide, the length of the transepts being 49 ft. across. The tower and spire are 136 ft. 3 in. high to the top of the metal cross.

The whole of the works, and also those of a commodious house for the minister, the Rev. Dr. Walbaum, at some distance from the church, have been executed by Messrs. Newman & Mann, of Upper Thames-street, from the designs of Messrs. E. Habershon & Brook, of Bedford-place, Russell-square, architects. The cost has been about 10,000*l*. Mr. Weekes is clerk of works.

The ancient reredos, the organ-case, pulpit, &c., are restored by Mr. Jacoby, and will be re-fixed, the architects desiring to retain these memorials of the old building, which are of considerable beauty, but of totally different style from that of the new church.

PIECE-WORK AND DAY-WORK, *i.e.* HOUR-WORK.

THE disputes at Erith give rise to many reflections which it is not our intention to ventilate at length. On the threshold of our remarks let us be plainly understood to say that the employer has a perfect right to adopt the system of piece-work in carrying out his contracts, and that the workman has an equal right to refuse working by that system if he considers it an unfair one. So long as no coercion is used on either side the system of piece-work may be allowed to stand or fall upon its merits. The present writer has had ample experience of both sides of the question, and has witnessed the benefits and drawbacks of both methods. Piece-work is undoubtedly a system of competition, and the more extensive the system the more fierce becomes the competition. Where quantity instead of quality is expected in ordinary or mere routine work, the younger and stronger man will reap the advantage, and will often if not always draw more wages than the older and more experienced. In work where quality is desirable the better and safer workman is generally the elder craftsman; but even in his case a lump price for the whole piece of work in contradistinction to piece-work prices for parts of the whole, would not be an injustice.

In the building trade the piece-work system is of old date, although not general. Probably long before the era of the introduction of wood-working machinery into the building trade, the piece-work system was more extensive than what it is to-day. The making of doors and sashes, and the trimming of doors and windows, have been done long years ago by piece-work or by the foot. Working by measurement is nothing short of piece-work, and there is at present a large amount of carpentry, joinery, bricklaying, and other building work executed by measurement, both on the part of builders and workmen in different parts of the three kingdoms. If employers and workmen (we are constrained to use the word "if") were, as a rule, conscientious in the matter of turning out good work very little could be urged against the piece-work system. Like all systems, it is liable to abuse; indeed, abuses are inseparable from its adoption as well as abuses are inseparable from payment by the day or hour. It is an undeniable fact that many operatives do not do a fair day's work for a fair day's wages; but it would be unfair to stigmatise a whole class for the unprincipled conduct of a minority. In a well-regulated workshop, with efficient, fairly-paid, and independent foremen, no difficulty need be experienced on the head of exacting a fair day's work for a fair day's wages. Whether the workmen are paid by the hour or piece, if they are not efficient their services can be dispensed with. Employers are not obliged to keep hands who do not answer, though it must be allowed, at the same time, when hands are scarce and contractors are bound to time, they are compelled, through necessity, to make the best use of the workmen they are able to obtain. Apart from mere routine-work, there are few branches which need more careful and conscientious work than that of the engineering branch. The sad disasters that startle the nation now and then by sea or land, suggest, certainly, sorrowful thoughts perhaps, that "scamped" workmanship and bad materials have been contributors to the disasters. We are fully conscious of the large amount of scamped work that takes place in the building trade, and which we have often exposed in these pages. Some speculative building work is performed by day-work, but at a lower rate of wages than what is paid by respectable builders. A large number of the "Jerry" buildings are put up by inferior workmen, and youths, in many instances who have but little knowledge of their trade, but who work under a leader, and who also work by the piece or job. This kind of scamped, or "slush," or "slop," work would not of course, pass current with a respectable London firm. In the metropolis and throughout the provinces staircase work is often done by the piece, or by measurement, or so much per step or stair, and excellent work is often done in this way by men who make stair-building their peculiar work. In the building and cognate branches there is a class of work well suited to be done by piecework, while there is a large amount of other work of a miscellaneous character which could not be brought under any system of piecework. To the young and strong piecework could be held out as an inducement to greater exertion on the part of workmen; but care should be taken that the work should not be accepted by the employer if "scamped." The unprincipled employer might profit by the transaction, the operative might profit, but the public would be grievously wronged or deceived. In fact no hard and fast line can be laid down in any one trade for regulating the exact limits of the piecework system, neither should a number of men, willing to avail themselves of the system, be coerced by their fellow-men. If piecework leads to an overstraining of the energies so does the system of overtime by the hour system. Both systems entail long hours, though they bring more wages. If men unduly deprive themselves for several days or weeks of their natural amount of sleep by a prolonged system of overtime by the hour system, even with double payment, they are in the end losers instead of gainers. We are aware that overtime is cried out against by trade societies latterly in several trades; yet we know it as a fact that many societies who have cried out against it publicly have allowed their members to work overtime month after month. We are averse to both "lock-outs" and "strikes," for we believe both to be evils, and though either might be used righteously under certain circumstances, they are too often resorted to as offensive weapons, and they often entail injury and hardship on the users. The piece-work dispute between employers and workmen will never be settled by the medium of a "strike" or "lock-out." Piece-work has existed for centuries and will probably exist until the end of time. It will be adopted more or less according as appliances favour its adoption and self-interest prompts the individual workman or the many to make the most of their time. Before the hour system was adopted, many workmen thought that a greater evil could not be introduced, but it has proved the reverse. Piece-work, under limitations, and in some trades, must prove an advantage, but in the hands of unprincipled employers and manufacturers there is a tendency under the system to lead to the execution and production of much inferior work. Great production leads to the overstocking of the market, and it is not advisable, even if more work is done and more goods are produced, that the surplus shall be of an inferior description. Viewed in this light, of course, a reduction in the price of goods and a reduction in the price of labour is inevitable.

In what we have above written it will be seen that we recognise the right of the employer and the employed to adopt or reject a form of labour that is pleasing or objectionable to them. Freedom of contract, and time will bring about better relationships.

COLOUR IN REALITY.

SIR,—My friend, Mr. W. C. Thomas, in his letter last week, seems to assume that I am too positive in what I assert; that "we cannot, off-hand, be confident that our first notions upon any portion of that subject are right." But without going into the question whether my assertions are first notions or not, I must confess that I do not clearly understand his theory as applied to colour. He describes pictures as having no inherent colour. I, however, look upon colour as a fact; that everything in nature, without a single exception, possesses its own inherent colour. That colour exists as much as form does, and that we cannot have form without it. That we cannot see form or colour without light and the use of our eyes, but that both exist, nevertheless, whether there be light or not, or whether we can see them or not. I take a brick—a red one. I break it—it is red all through. Can "W. C. T.'s" reasoning make me believe that that brick has no inherent colour? So it is with every substance on the face of the globe, or for miles above or below it. Everything has its own colour.

How the sensation of colour arrives at my eye, or whether by the corpuscular or the undulatory theory, I am unable to explain. I only know that I am able to distinguish between different colours in a perfectly simple and natural way,

and in the same manner that every one else is able to do. There may be some exceptions as to the particular tone of colour which some people see,—as in the case of those who are afflicted with what is called colour-blindness. But they see *colour* all the same, although it may not exactly agree with what we see; and, perhaps, further, no two people ever do see colours exactly alike; but as we cannot detect the difference between each other's eyes, colours become the same to all of us who see in the ordinary way. I have, however, long held the opinion that colours alter in different countries; that they become brighter and more beautiful in countries where the atmosphere is clearer and brighter; that pictures and architecture look more beautiful in Italy or Greece than they would do in our Northern climate. Even in our own works, that they look more beautiful in summer than in winter—better at one time of the day than another. I saw this fact last autumn, when I beheld the west front of Lichfield Cathedral, which as every one knows is plastered over with a wretched coloured cement, lighted up by the setting sun, with the most lovely and glorious colour, that gave the whole front a beauty that I never saw before!

I shall be told perhaps, that this was only a sensation—momentary. Well, agreed it was so, and I acknowledge that it was not the inherent colour of the cement; but it was a fact for all that, and my mind still retains a vivid recollection of its beauty. All colours look different under different circumstances. Grass in sun-light and grass in shadow are two different and distinct shades of green. Grass when seen lighted up by the rising sun is of a golden green, while the long stretched-out shadows look to be of a pure ultramarine. Grass, however, is still green to all of us, and of that particular kind of green that we all know and do not recognise again in any other form of vegetation. So it is again with every tree and plant throughout nature—all have their own peculiar shades of green. As it is in the forms of leaves, no two ever being precisely alike, so it is with colours. No two plants, of different species, have ever the same shade of green.

JAMES K. COLLING.

WORKING DRAWINGS.*

IF we remember for a moment what is meant by "working drawings," and what is the duty they have to perform in our art, we shall, I think, come to the conclusion that the matter is deserving of our best attention. Working drawings, then, generally speaking, are the means by which our ideas can be realised in actual materials; they give our clients an idea of what we intend, and they convey to the contractor an explanation of the works to be done under the contract.

To acquire the knowledge to prepare in a creditable manner the necessary working drawings, there are many opportunities; first, you have the opportunity of seeing such in your principal's office, then you can visit the works in progress, access to which is very readily granted, and this if properly carried out, I consider to be one of the best forms of education in this direction. You can see in the art and scientific journals the latest information to be had on these subjects. There is photography in all its branches, as well as all the other different forms of illustration, putting before you the choicest examples of ancient and modern work; and, though last not least, you have the sketching tour. This I consider a most important feature of your education. Take up a door or window or any other portion, and thoroughly measure it, and carefully sketch in the mouldings, marking the construction and jointing of the masonry. Then carefully study, and sketch the figure and sculpture, and never leave the object till you feel that you have made accurate drawings of the whole. This will, I believe give you a better idea of what is necessary for a working drawing than almost any other form of study; it is also calculated to give you great confidence in your own efforts, as you need be at no loss for information on similar points while you have those studies by you. You must, however, avoid making the preparation of the drawings your whole care, remembering the end of all drawings should be simply to help to realise the actual construction. It should be your anxiety in your general drawings to represent on paper, as simply and faithfully as possible, the appearance and effect which the work, when realised, will present.

To explain your ideas to the workman and artist who may be assisting you to carry out your design, it is absolutely necessary that your geometrical drawings should be clear and distinct, bold and truthful. A little extra time spent in this way at the beginning, and you need then have little fear that the work will be otherwise than as you had designed it. It will also, to a great extent, prevent the possibility of any difference arising between you and the contractor in the carrying out of the work; it is surely only simple justice that you give the contractor a full idea of what you intend before you ask him to send his estimate of the cost. This will, I believe, be productive of the greatest good feeling amongst all parties, clients, architects, and contractors, and you will then probably hear less of that most annoying subject,—"extras."

Working drawings should include every information that is necessary, taken with a full clear specification for explaining to the contractor and to the workman the work to be done, and the proper way of carrying out such work in the best manner. It is not necessary, in my opinion, that they should be prepared in any regular or uniform manner,—they may include the rough sketches given, perhaps, on the scaffolding to explain away some difficult point to the foreman, the ordinary detail drawings given with the general contract plans, the full-size details or the marginal sketches given in your specifications, these are all working drawings. In fact, everything that is necessary to explain your views as to the proper carrying out of the work is a working drawing. Sketches are oftentimes very useful for this purpose, for you will occasionally find that where an ordinary drawing fails to make itself understood, a perspective sketch seldom or never fails. It will be well, however, to prepare, in the first instance, in connexion with the specification, a full set of plans, and I would recommend that for buildings for domestic purposes, it consists of general plans, sections, and elevations, most carefully figured. . . . .

In preparing the details it will be well to make plans of every portion, and carefully figure all the widths and heights; the plans of the window should include — plan, exterior and interior elevations, and section, as well as full-size sections of the mouldings; the plan should show carefully the different materials used, the bonding being distinctly marked; the elevation should show the general features, the construction being distinctly marked, the sizes of the stones and other materials being clearly indicated, and the centres of all arches shown. The showing of the sizes and jointing of the material is most important, as this has oftentimes a great deal to do with the appearance of the work; it may also have an influence on the value of the work, and therefore it should not be left in doubt. The interior elevations should clearly indicate the kind of sashes, shutters, skirtings, and trimmings; lintels should be shown, their thickness and bearings, and the discharging arches turned clear of them; then large details, say full-size, should be given of the different parts requiring such. In the cills or strings you should be careful to show the raised seats for the jambs, rebates, and weatherings for the frame; the moulds of your architraves and panels should be shown. The same general principles will apply to the windows of a church or other public building.

The details for the door should show the construction, sizes of stones or other material, the bonding steps, arches, and centres, as well as manner of securing the frame and other woodwork. It will be important to make plans or sketches of the different portions, and see that they realise your wishes; do not content yourself with the general elevations and sections. It very often happens that when we have depended on these, the result is quite different from what we had intended. Take a door or window (as on the accompanying sketches) with an attached or detached shaft: the geometrical elevation may look quite satisfactory, the cap appear to have legitimate work to do, to do it effectually; but yet, owing to the distribution of the work over it, or the kind of mouldings on the arch-mould, the result may be most unsatisfactory; the shaft, in fact, from different points of view appearing to have less to carry than it should, the line of the shaft oftentimes being outside the line of the archivolt at the springing. This great evil will be avoided if you thoroughly study your work. . . . .

To conclude, you should have a thorough knowledge of construction and the uses of materials; you should also have a general knowledge of all the trades. This is absolutely necessary for the proper preparing of your working drawings. How can you possibly expect that workmen will understand your ideas, that are, perhaps, somewhat new and strange to them, unless you put these before them in a perfectly clear and intelligible form? Without this your client will not have that confidence in you which is necessary; while the builder, who is really anxious to have the benefit of your assistance and to follow your plans, too often finds that, in matters within his own province, you are at fault, and thus your influence is weakened. Let this not exist, and the aid of the architect will be more generally sought: the public will feel that their interests are safe in his hands; that technical knowledge and artistic taste are employed in their behalf, and will place themselves unreservedly in his hands; and thus the cause of art and the interests of his client will be served in the end.

* By Mr. J. J. O'Callaghan. From a paper read at ordinary general meeting of the Architectural Association of Ireland, on the 30th of December, 1875.

PARISH SCAVENGING AND WATERING.

THE Vestry of Chelsea, finding they were called on to pay more and more for the scavenging, watering, and removal of dust, without, as it seemed, sufficient reason, or with satisfactory efficiency, referred the subject to their surveyor, Mr. G. H. Stayton, who has submitted an elaborate report to show that a saving would be effected by the Vestry doing their own work. From the report it appears that the estimated cost for the coming year, under the present system, would be 6,935*l.*; but by the Vestry providing their own men, horses, and plant it would be 5,445*l.*; showing a saving of 1,490*l.*, which in four years would more than repay the 4,636*l.* which it is estimated would be the original outlay for horses and plant.

From Mr. Stayton's report we learn that Newington performs the whole of the parish work without contracting for it. The refuse is conveyed away by railway, and sold to farmers for a price varying from the actual cost of carriage to a profit of sixpence per ton. Great satisfaction is expressed with the system. Islington does a portion of the parish work itself, and contracts for the remainder. The refuse is carried away by means of the canal. Entire satisfaction is given by the non-contracting plan, and it is contemplated to extend it to the whole of the parish. St. Luke's, Old-street, has for some years adopted the same plan as Islington, and finds it pay. Bermondsey, also, does without contracting. The refuse is conveyed away by barges from a wharf alongside the river. The Vestry derives considerable advantages from the system. St. George's, Hanover-square, does its own work for two-thirds of the parish as regards cleansing and watering the roads, but contracts for the remaining third and for the whole of the dust removal. The refuse is carried away by canal, and costs for its disposal about three shillings and two pence per load. The system gives satisfaction. Lewisham partly does its own work, and partly contracts, and the surveyor is of opinion that the system works well. We are bound to say that, looking at the figures alone, we should not be sanguine as to the saving that would be effected in Chelsea by the change proposed, but we are quite ready to believe that the work would be done more completely than it is at present.

The Vestry have adopted for the present a modified scheme, by which it is believed a saving of several hundreds per annum will be effected.

PROPOSED INVERNESS AND GLASGOW RAILWAY.

IT is proposed by Mr. S. M'Bean, C.E., to construct a single line of railway from Inverness through the great Glen and Glencoe to Garelochhead, the present terminus of the Glasgow, Dumbarton, and Helensburgh Railway, and a branch line to Kyle Rhea, through Invergarry, in connexion with it. Preliminary estimates have been prepared for the main line, which amount to 1,542,000*l.* for about 145 miles of railway and rolling-stock, including also extensive workshops at both termini of the new railway. A suitable site for the Inverness station has been selected on the west side of the river, and a convenient junction will be formed with

the Highland Railway opposite the Thornbush Brewery without destroying any house property. The proposition is receiving some attention, and appears to us to deserve more. There are hundreds of thousands of acres of land in Inverness-shire and Argyllshire that the railway would be instrumental in developing and bringing into a high state of cultivation within a few years.

There is an immense deal of money being squandered annually on foreign loans through the criminal action of our financial agents, some at least of which we should gladly see diverted into channels where its honest disposal and expenditure can be watched without difficulty. The tract of country through which the route has been projected is capable of immense development, and the mails north and south will be accelerated three hours. Fish fresh from the whole west of Scotland and the Hebrides will be poured into the midland towns and London, in great quantities, on the opening out of this railway.

THE WORKING OF RAILWAY TUNNELS.

INSTITUTION OF CIVIL ENGINEERS.

IN the course of a paper on "The Ventilation and Working of Railway Tunnels," by Mr. G. J. Morrison, C.E., the author, after a slight allusion to the possibility of destroying the evils arising from the products of combustion, alluded to the hot-water locomotive, on which principle engines had been working on tramway-cars for some years; to a description of locomotive the boiler of which had a receptacle for a mass of red-hot iron, or of heated fire-bricks, something on the plan of the tea-urn; to the compressed air-engine; to the pneumatic system; and eventually to the atmospheric system, one of the few which held its own for a time against the locomotive engine, and the mechanical difficulties of which were all worked out years ago, with one exception, namely, that of dealing with a single tube of great length. There was yet another method of working long tunnels, and that was by means of ropes. This plan was minutely discussed; and, in conclusion, the author recapitulated his views as to the mode of dealing with tunnels exceeding seven miles in length in the following terms:—First, when long tunnels without shafts had to be ventilated, a current of air should be caused to pass through by means of a fan placed near one end, that end being closed by doors. Secondly, for a given amount of traffic, the power required to ventilate long tunnels varied as the fourth power of the length. Thirdly, when a long tunnel had to be ventilated, it was more advantageous to have a double-line tunnel than two single-line tunnels; and fourthly, for a tunnel of given length there was a limit to the traffic that could be carried on by locomotives, beyond which ventilation became impossible, and when that limit had been reached, some other tractive power must be employed.

WORKING MEN IN ENGLAND AND AMERICA.

IN pursuance of instructions, United States consuls in Europe have been supplying to their Government some information relating to the labouring classes, and the chief of the Bureau of Statistics has published the results of the inquiry. The *New York Times* says:—"The general conclusion to be drawn from the answers is unfavourable to the efficiency of English labour as compared with American. The explanation given is probably the true one—that it lies in its greater 'adaptability' owing to the superior education and intelligence of the American factory workman, and in the more temperate American social habits. The English workman requires a day or two to get over his Saturday night and Sunday drinking sprees. The extent to which the English labouring class drink up their wages appears in a melancholy form in this report. The consul at Sheffield reports that great numbers of working men stop work on Saturday noon, and do not commence again till the following Wednesday. This is, in part, because they need Monday and Tuesday to enable them to recover from the effects of Sunday's drinking. 'Increase of pay,' says the consul at Birmingham, 'means increase of drink.' In Manchester, our consul reports that many sober working women complained that increased wages and shortened hours of labour were a curse to families, as the men were only the more tempted to drink. In Liverpool there seems a wide-spread and fearful demoralisation of the labouring class from their intemperate habits. And thus from all the manufacturing centres our officials report a wretched condition of working men's families, and reduced efficiency of labour from the habits of intemperance prevalent. A curious fact also appears in these researches—namely, that a rise of wages does not always produce more work. Thus in the collieries of Leeds the product for each person in 1864 was 327½ tons for 313 working days, or 21½ cwt. for each person per diem. In 1868 it fell to 317 tons, or 20 cwt. per diem. In 1873 to 17½ cwt. for each person per diem. This is a reduction of production in ten years of 19 per cent., while wages have risen 30 per cent. and upwards. In Manchester, the average earnings of a certain mine were 4s. 7d. per day in 1871; in 1872 the wages had more than doubled, and yet the earnings were 2d. less per week for each man. The workmen averaged less than four working days per week, while many only worked three days. The statistical proof presented by the United States Bureau of Statistics of the terrible loss and degradation to the English labouring classes produced by their drinking habits will not be one of the least of the good results accomplished by this able report."

NEW BANK AT DERBY.

THE structure recently erected in the Market-place of this town, from the designs of Mr. Isborn, architect, as a new bank for Messrs. S. Smith & Co., has been completed. The banking-room is 40 ft. by 50 ft., lofty, well lighted, and appropriate. The pavement is mosaic. The walls of this room, upon the business or counter-side of the room, are ornamented at the foot by a dado panelling of wainscot oak, with bold plinth and surbase mould of admirable finish. Above this the walls are morone, decorated with free-hand ornament, Grecian in its design, whilst further up, a mid-cornice divides the height, and adds to the appearance of the room. The plaster ceiling, which is heavily panelled and richly moulded, is supported by four columns, having Corinthian capitals. The ceiling is further ornamented, in the centre, by three large sunlights, supplied by Messrs. Strode & Co., of London. To both sets of windows are fitted Bunnett & Co.'s patent iron revolving shutters, the merits of which, for convenience and security, are too well established to need any comment at our hands. The whole of the fittings in and about the banking-room are of wainscot oak, except one portion of the panelling on the off-side, where the grain has been so skilfully imitated that none but the most practised eye would know that the original had not been employed. This is the work of Mr. Felton, a skilled artist employed by Messrs. Arrowsmith, of London, who have supplied the most important part of the furniture and decorations in this and other parts of the bank. The locks here (and, indeed, throughout the bank) have been supplied by Chubb, of London; and the two safes, which are of unusually great size and strength, are by Milner, the manufacturer of this *spécialité*. From the outer strong-room one of Bunnett & Co.'s raising-machines lifts the books, &c., into the banking-room above, and the trolly which contains them can there be pushed with ease into any part of the establishment. The gas arrangements were fitted by Mr. Brassington, of Derby.

The works have been carried out from the designs of the architect by Messrs. J. & E. Wood, contractors, of Derby, under the immediate supervision of Mr. Albert Barratt, as clerk of the works.

ON HYDRAULIC RAMS FOR COTTAGE WATER SUPPLY.

MR. J. A. DAVENPORT, surveyor to the Nantwich Rural Sanitary Authority, says there is at Lea Hall, near Nantwich, an arrangement which, in many instances, might be copied with advantage. There is a similar means of water supply in Bartherton township, and although there is nothing new in raising water by means of hydraulic rams, still he thinks there is a novelty in the general application of the little rams erected at these places.

The water supply at Lea Hall is lifted from a stream which has been dammed, so as to obtain a head or fall of water of 8 ft. 6 in. to the ram below, the supply of water to the ram being about 25 gallons per minute; the water is lifted to a tank holding about 2,400 gallons at a distance of about 100 yards, and at a vertical height of about 50 ft., the ram supplying water at the rate of 180 gallons in the hour, or say 4,300 gallons per twenty-four hours. From the tank mentioned the house and farm buildings are supplied. There are taps at all required points in the farm-yard for the 75 head of stock, taps to the stables, watering troughs, and for the engine. To each boiler in the cleaning-shed there is a tap; the kitchen boiler and range are also supplied with water, and it might be thrown into the bed-rooms or the highest point in the house. The ram has now been working night and day continuously for eighteen months, and its entire cost during that time has been only one shilling for a new washer, and there is no sign of depreciation or wear and tear.

Taking the present as an instance, there would be a sufficient supply in the Lea Hall tank to give twenty gallons per twenty-four hours to 200 cottages, and cottagers at present seldom use more than six gallons in twenty-four hours, and the cost per annum (terminable say in thirty years) to each house would, irrespective of rights of way or water rights, hardly reach a shilling, making some allowance for additional mains.

These rams are supplied by Messrs. W. & B. Douglas, an American firm, and range in price from 50s. upwards.

COUNTY OF DURHAM LUNATIC ASYLUM.

AT the Epiphany Quarter Sessions, holden at Durham on the 6th inst., it was resolved that the county engineer and architect do prepare plans for an "auxiliary building," on the present Asylum estate, at Sedgefield, to accommodate 400 chronic patients. This was adopted in lieu of building a second asylum, as it was considered the buildings for this class of patients would be much less expensive than the usual asylum buildings, and that the cost of maintenance would be less than in the asylum. The structure will be a detached building, at some distance from the present asylum, but yet under the management of the present superintendent, medical officer, and assistants. The grounds of the present asylum are 200 acres in extent, in a rich, loamy soil, over a great depth of gravel and sand.

ST. BUDEAUX CHURCH, DEVON.

Now that the mother church of St. Andrew, Plymouth, has been beautifully completed (under Sir Gilbert Scott), the restoration of her daughter, the sadly-neglected church of St. Budeaux, is to be proceeded with. For a Post-Reformation structure the church is of considerable interest. It was built about 1560, and consists of nave, north and south aisles, with a well-proportioned tower at the west end. There is only a quasi-chancel at the east end. The Perpendicular details are nearly as good as those of Devonshire churches generally, a century earlier, but the edifice has been as much desecrated by successive churchwardens, and has in various ways suffered as great barbarisms as it is possible to imagine. An influential committee has been appointed, and under the direction of Mr. James Hine, architect, Plymouth, the church will be restored this year. Here was married the famous Sir Francis Drake, and here his wife was buried. There are several monuments to members of the Fortescue and Stukely families.

Improvements in Mortar Mills.—According to the *Birmingham Gazette*, Messrs. W. M. Ward & Co., of the Limerick Foundry, Great Bridge, have recently patented some important improvements in mortar-mills. "The Patent Dwarf Mortar Mill," which is adapted for crushing and grinding mortar, and for mixing sand and cement, is very light and simple in construction; it can be worked with small motive power, and it is so arranged that the mortar can be passed up a discharging trough by the revolution of the pan, thus dispensing with the labour of emptying the mill with a shovel. These improvements are effected by the upright standards being little more than half the usual height, and the awkward top-cross heading being done away with, oscillation and vibration are reduced to a minimum. The invention emanates from Mr. Ward, and the new mills already are rapidly superseding the old ones in many large manufactories.

THE STATUE TO LORD PALMERSTON AT WESTMINSTER.

PREPARATIONS are being made for the erection of the colossal bronze statue to the late Lord Palmerston, at Westminster, in the inclosure opposite Palace-yard, at the angle of Great George-street and Parliament-street. The excavations for the foundations on which the pedestal of the statue will rest have already been dug out, and the brickwork basement for the pedestal is being put in. The pedestal consists of several massive blocks of polished Aberdeen granite, the basement part of which is 6 ft. in width and 4 ft. in height, the extreme height of the pedestal being upwards of 14 ft. The statue itself is about 9 ft. high. It is expected to be completed and ready for inauguration shortly before Easter, and it is stated that the Queen, or some other member of the Royal Family, will be asked to unveil it. It will form a prominent companion work of art to the statue of the late Earl of Derby on the opposite side of the inclosure.

BUILDING ON RUBBISH SHOOTS.

WE have done our best to convince authorities of the evil of this practice and the extent to which it is carried on, and, we may hope, not wholly without success.

Hackney is thoroughly awakened, and has sent a deputation to the Home Secretary (Mr. Cross) to learn if Government will assist in carrying through some measure to enable authorities to put a stop to the nuisance and danger in question.

Dr. Tripe made a strong statement, and

The Home Secretary, in reply, said,—This is a matter which was brought under my notice incidentally last year, when I was discussing the question of buildings, and I had to go into it to a certain extent, quite enough to make me aware of the great danger which does arise—though people do not know it—from the circumstances you have just mentioned. As Mr. Booth has said, in the country he believes there is power, if it is put in force, which would give a remedy, and no doubt that will be attended to, and I will take care to see whether some provision can be made affecting London. You must give me a little time to think it over, and consider what can be done to remedy what is undoubtedly a very serious evil.

IMPORTANT PROCEEDINGS UNDER THE PUBLIC HEALTH ACT.

AT the Saffron Walden Borough Petty Session, on the 18th inst., Mr. R. Perry, of Debden, Essex, was summoned at the instance of the Mayor and Corporation of Saffron Walden, to show cause why an order should not be made upon him for the payment of 66*l.* 10s. 8d., being the expenses incurred by the Corporation acting as the Urban Sanitary Authority in doing certain necessary works which the defendant had neglected, after notice, to do himself.

It appeared from the statement of the counsel for the complainants, and the evidence adduced in support thereof, that the defendant is the owner of a number of small houses in the borough of Saffron Walden, called Upper-square. In the early part of last year repeated complaints were made by the inspector of nuisances, the surveyor, and the medical officer of health, of the bad and insufficient privy accommodation and defective drainage of these premises, and ultimately on the 13th of July last, the Urban Sanitary Authority directed the inspector of nuisances to serve Mr. Perry with a notice in writing requiring him to do the necessary works within twenty-eight days, and giving him notice that in case of his making default in doing so, the Urban Sanitary Authority would themselves proceed to the work, and to recover the costs of doing so from the owner in a summary manner, by proceedings before the Justices. Mr. Perry took no notice whatever of the matter, and after some further delay, the Sanitary Authority in November last ordered a builder in Saffron Waldon to execute the works, which he did, and his charges, amounting to 66*l.* 10s. 8d., were now sought to be recovered from the defendant.

The defendants' counsel took a number of technical objections to the various notices and proceedings, but admitted that he could not ask the Justices to open the question of the reasonableness of the builder's charges, as it had been decided by a superior court, but the duty of the Justices, in such a proceeding as the present, was purely ministerial.

The Mayor, after consulting with the other Justices present, announced that the order applied for would be made for payment by the defendant of the 66*l.* 10s. 8d., but, at the request of his solicitor, they consented to state a case for the High Court of Justice upon the technical objections taken by him.

Registration of Trade Marks. — The Registry of Trade Marks is now open in Quality-court, Chancery-lane.

MISTAKES AS TO EMIGRATION.

NEW countries want strong arms and energetic minds.

The Brisbane correspondent of the *Grafton Argus*, speaking of a cargo of emigrants which had arrived in Queensland, says their presumption was boundless. They expected 2*l.* and 3*l.* a week, and were prepared to fill any position, whether they knew anything about it or not. They looked admirably adapted for washing their masters' spoons, preparatory to putting them in their pockets. One little chap, who looked as if he had been engaged in the exploration of pockets, said he would take a billet as ploughman if he could get nothing else, and the following original dialogue took place:—

Q. Have you been accustomed to ploughing?
A. Never saw a plough in my life.
Q. What were you doing at home?
A. Engaged in a machine-shop in London.
Q. In what department?
A. Turning the grindstone.
Q. Then you think a man whose genius comprehends the mysteries of a revolving grindstone could hardly fail to guide a plough?
A. It is just as difficult to turn with one hand and grind a chisel with the other, as steering the handles of a plough.
Q. What wages do you expect?
A. 2*l.* a week and found.
Q. Don't you seriously wish you may get it?
A. I intend to go home and write to the papers about the way we are allured out here and then get nothing to do.
Q. Have you ever filled any other dignified position than that of grindstone revolver? Did you ever learn anything else?
A. Can't say I ever did.
Q. Then you came out here entirely ignorant of any kind of work, and no idea of doing anything at all, and feel disgusted because some one won't rush up and offer you double the wages of an experienced hand?
A. We were deceived by the agent, and intend to go back.
Q. If you can by any possible means persuade all your friends to go home with you, it will constitute a very great favour to the new country, and if you get drowned on the way back so much the better for the old country.

A BUILDER'S CLAIM FOR "EXTRAS."

GROVES *v.* HOLT.

AT the Wolverhampton County Court last week, before Mr. A. Martineau, judge, Mr. Andrew Groves, builder, Wolverhampton, sought to recover from Mr. George Holt, fruiterer, the sum of 17*l.* 18s. for extras incurred in the erection of a house in Stafford-street for the defendant.

It appeared that defendant engaged with Mr. Groves to erect a house in Stafford-street at a cost of 200*l.* There was no written agreement, but after the work specified had been completed defendant's wife gave orders for a cooking-range to be erected, and other additions were ordered which cost 17*l.* 18s., the sum claimed. Plaintiff gave evidence in support of the above facts, and stated that the specifications detailing the work to be done had been returned to Mr. Holt On behalf of the defendant it was stated that the whole of the work was to be done for the sum of 200*l.*, and nothing was said about the extras until some time after the completion of the work. The 200*l.* were paid in instalments, and the last 50*l.* were handed over to the plaintiff soon after the work was finished. Mrs. Holt denied ever giving orders about the cooking-range to be put in at an extra cost, and both she and her husband denied ever having seen any specifications. Defendant wanted a specification, but plaintiff said it was not necessary in a small job like that. His Honour said the burden of proof as to the amount claimed, being for extras, rested upon the plaintiff. It was a loose contract. He thought the defendant and his wife were under the impression that the 200*l.* were to include all the work. Under the circumstances he should give a verdict for the defendants, with costs.

EDUCATION FOR WORKMEN.

SIR,—I am glad to see this question of technical education once more about to be discussed in your columns; and I hope it will cause many artisans in the various branches of the building trade to arouse themselves and seek to raise the standard of working men in this country; for, as your correspondent says, there is a lamentable deficiency of technical education in the building trades, and consequently of mechanical skill also. It cannot be denied that a man who possesses a knowledge of the principles on which his craft is founded must be a better workman than he who is ignorant of them. Let a man possess a good knowledge of geometry and drawing, and he will find that it greatly facilitates his work; for he will see a way of doing scientifically and correctly what he before did blindly and by the rule of thumb. But I fear it will be a long time before we shall be able to arouse the workmen from that lethargy into which they have fallen. I hope I may be disappointed in this, but I speak from my own experience.

About three years ago, when I came to Banbury, I started classes with the above object, and have continued them for three successive winters, but with very poor results; for out of about 100 carpenters and joiners, besides other trades which are employed in Banbury, the average attendance at these classes has been about twelve. At first the attendances were a little better, but they gradually dropped off. I had two bricklayers for a short time, but they probably learned enough in a few weeks, for they never came after. It may be that it is too cheap, for I give my services gratuitously, and have frequently paid money out of my own pocket to help to support these classes; and since I commenced they have been a direct pecuniary loss to me. We meet three nights in the week, and the subjects taught are plane and solid geometry, building construction, drawing and isometrical projection, arithmetic and mensuration. I have to be continually urging upon the men the necessity and importance of technical education. I simply state these facts to show how lethargic working men are in respect to technical education.

I would most willingly give my assistance and support to any practical scheme which would tend to obviate these evils; and I consider your correspondent's idea of starting an institution of working men, for the purpose of extending technical education, a good one, likely to be productive of good results, and much practical information would be derived from the papers which would be read.

FRANK CHESSELL, Builders' Foreman.

THE PAYMENT OF WAGES.

SIR,—Statistics have lately been published which show that the greatest amount of drunkenness takes place at the end and beginning of the week.

Now that Saturday is a half-holiday, and Monday a recognised "spree" day, the almost invariable custom of paying workmen on Fridays or Saturdays exposes them to irresistible temptation, and I believe that if employers could be induced to pay wages in the middle of the week, it would prove a practical step in the right direction.

Moral weakness is the working-man's weakness, as it is that of all classes, and many a workman would only be too glad to be assisted to avoid the temptations which now beset him on and after pay-day.

I am confident that if employers would give my proposal a trial, they would be gratified with the result, and be the means of saving many a family from improvidence and consequent misery. ONE WHO PAYS ON WEDNESDAYS.

STAINED GLASS.

Tuxford.—Mr. Charles Story, of Worksop, has presented a three-light window in stained glass, in memory of his sister, Mary Story, to the Parish church. The centre light represents our Saviour blessing little children, with ribbon scroll, and the inscription, "Suffer little children to come unto me." The right-hand side-light contains two figures representing Faith and Hope with their accustomed emblems, and the left-hand light Charity. The window is by Cox & Sons, London.

Wolverhampton.—A stained-glass window has just been placed in the north aisle of St. Peter's Church, Wolverhampton, to the memory of the late Mr. Langman, by Messrs. Heaton, Butler, & Bayne, who executed the wall-paintings in the chancel. The centre compartment represents our Lord calling and blessing little children. On the left hand there is a picture of Jonathan trying to make peace between his father Saul and David. On the right hand is a scene from the parable of the Good Samaritan. On either side in the upper tracery of the window are crowns representing the reward of the peace-makers and the merciful. The tree of life forms the background of the whole window, with "its twelve manner of fruits," and "its leaves for the healing of the nations."

Liverpool Art Club.—At the annual meeting of the committee of the Liverpool Art Club, held on the 20th inst., Mr. Holbrook Gaskell was appointed president for the year, and Mr. T. Mathison and Mr. J. F. Collier, County Court judge, were elected vice-presidents; Mr. James L. Bowes and Mr. P. H. Rathbone were elected honorary secretaries.

BLACKPOOL WINTER GARDEN AND PAVILION COMPETITION.

THE three premiums offered for the above,—50*l*., 30*l*., and 20*l*.,—have been awarded as follows:—1st, Messrs. Mitchell & MacLeod, St. Ann's-square, Manchester, and Oldham; 2nd, Messrs. Cobbet & Sons, Manchester; 3rd, Messrs. E. & E. B. Ellis, London. The first-named firm have been appointed by the directors to carry out the works.

PROGRESS OF BELFAST.

BELFAST has continued to make great progress during the year 1875. The number of houses built in the year was 980. The annual increase of population is about 6,000, and the total population is now above 200,000. About 17,000 houses have been built during the last fourteen years.

It appears from a report of the borough surveyor, Mr. Montgomery, C.E., that during the year 1875, 22,000*l*. have been expended on main drainage, making in all 40,000*l*. recently laid out in main drainage; 13,500*l*. have been expended in paving three of the chief streets; seventy-nine private streets have been sewered and paved; many footways have been flagged; several streets have been widened, some under "provisional order" obtained through the Local Government Board. The market buildings and slaughter-houses have been considerably extended; a chapel has been built in the cemetery; and improvements have been made in both the public parks; also in the quays, borough courts, and new municipal buildings. Seats have been placed along the chief roads, and the chief streets have been better lighted since the Corporation acquired the gas-works. Coffee-stands, drinking-fountains, and cabmen's shelters are being erected by private persons, under the direction of the borough surveyor.

The Harbour Board are widening and improving the harbour, quays, and docks, at a great cost, in addition to three docks recently completed.

ART AND SCIENCE CLASSES AT OLDHAM.

THE annual distribution of prizes in connexion with the Oldham School of Science and Art has just taken place. The report, read by Mr. T. Bailey, the secretary, stated that the session ending May, 1875, closed with 237 students, which was an increase of fifty-eight on the previous year; while even a greater advance is shown in the present term, as the number on the books already reaches 250. This large number of students necessitates an increased accommodation in the building, as all available space has long been appropriated to the use of the machine drawing, building construction, and geometry subjects, these classes now requiring three times the number of seats for the average attendance. Large time-tables, with lists of the prizes offered, were sent to the firms of machinists, builders, and cotton-spinners in the town and district. The result was very satisfactory, as by this means the attention of many young men was drawn to the science and art classes as a profitable way of spending some of their winter evenings. Special Queen's prizes were awarded to F. A. Caussidiere for machine drawing; F. W. Jackson, J. R. Sugden, and G. T. Wood for art drawings. Franklin Garside gained the fifth Whitworth Scholarship gained by the students of this school. Mrs. Platt endowed the school with 1,000*l*., the interest of which will next year realise 50*l*., which will be used according to the regulations of the Department of Science and Art in the form of two exhibitions. The art-masters are Messrs. Hague, Heywood, and Bottomley; and the science-masters, Messrs. Phythian, C.E.; Philip, M.A.; and Robertson. From a long report of the proceeding in connexion with the distribution of prizes the school appears to be somewhat exceptionally successful.

The Benefit of Two Staircases.— On the 17th inst. the cotton-mill of Ramwell & Lumley, Astley Bridge, near Bolton, was destroyed by fire. It was almost new, and contained from 20,000 to 30,000 spindles, employing about 130 people. Most of the workpeople succeeded in escaping by the staircase at the opposite end of the building, but eight had to be lowered by a rope of partly-prepared cotton.

Books Received.

Ancient Domestic Edifices of Bruges. Specimens from Drawings taken on the spot, by CHARLES VERSCHELDE, Architect. English Edition: B. T. BATSFORD.

THIS collection of drawings, showing specimens of a highly interesting and picturesque school of Mediæval domestic architecture, would have been more practically useful and *apropos*, in this country at least, had it been presented to us fifteen years ago. It represents a phase of Mediæval building which, though more practically suited to modern everyday necessities than any other of the period, was almost neglected by our Mediæval revivalists, who were anxious to apply the style of the cathedral to the street house, ignoring the fact that there existed precedents and examples for the application of Gothic treatment to street architecture in a perfectly natural and suitable manner, and without the introduction of features and methods of treatment only suitable to buildings on a great scale. And now that the practice of Gothic is on the wane again, and there is a new move in favour of the quasi-Classic style of the last century, which is defended as being the vernacular of modern building, we have such a collection as this of M. Verschelde's brought before us, representing equally the vernacular of Mediæval building, just when it seems too late in the day to make converts, or to persuade English architects to adopt the style of building which it illustrates as a model.

So at least the new or newest school among us would say; but, whether it be so or not, there is that in this book which is full of suggestion for the treatment of modern street architecture, if we could once get that at all into the hands of the architect, instead of the builder. Mr. Verschelde remarks that on the Continent also the study of the remains of domestic Mediæval architecture "has remained in the background." It was in the hope of preserving and making better known those examples that still exist, that he undertook some time back a collection of drawings of the old edifices in the town of Bruges, made on the spot, and accompanied by details of the construction and of any special feature in the architectural detail. Some of these the author regards specially as a means of preserving the record of peculiarities of detail and construction for which we cannot at present account, but which may be capable of explanation when this class of architectural remains has been more completely investigated.

The book contains forty plates, exceedingly well and accurately executed, and representing a series of house-fronts not unknown to a good many of our readers, but of which any architect engaged in domestic work may well be glad to have a record. The value and suggestiveness of these for the modern house architect consists partly in the fact that their varied and highly picturesque effect depends little, in many cases not at all, upon what is called "ornament," but upon skyline and grouping and arrangement of windows and piers, methods of finishing gables, &c. Some of the types of "fenestration" would be inapplicable to most modern street buildings certainly, but they serve to suggest something in the same spirit, with modifications; and they illustrate curiously the perpetual variety and play of fancy which seems to have been permitted free scope in the street architecture of this period, as contrasted with the eternal monotony of modern English architecture (?) of the same class. Independently of this, the book is highly interesting to the archæologist as a specimen of extinct forms of building, and to the lover of the picturesque in building its pages are delightful to turn over. The volume is attractive alike for artist and architect.

Emile Gilbert: Sa Vie, ses Œuvres; Notice Biographique. Par M. L. Cernesson. Paris: Ducher & Cie.

THIS is a reprint of the memoir of his deceased brother architect, read by M. Cernesson at the Congress of French Architects, at Paris, in 1873, taken from the "Annales" of the Société Centrale des Architectes. It is a short and sympathetic summing up of the life and career of the late M. Gilbert, with a brief description of his principal works. M. Gilbert was associated a good deal with large works of an eminently practical character, but not the less calculated to call forth and test the experience and ingenuity of the architect. The principal of these were the "Maison des Aliénés," at Charenton, and the prison at Mazas.

The Fine Arts and their Uses: Essays on the Essential Principles and Limits of Expression of the various Arts, &c. By WILLIAM BELLARS. Smith, Elder, & Co.

THIS is a very neat volume, containing a series of rather verbose essays on the capabilities and boundaries of the various arts. Mr. Bellars appears to have correct ideas on this subject, and displays refinement of feeling in his mode of writing and in the tastes and preferences implied thereby; but we cannot see that there is anything in the book beyond what is matter of everyday perception to all persons of ordinarily cultivated minds, and who are conversant with contemporary art. A book containing nearly 400 pages of print on the subject of art-principles should either possess original ideas, or a forcible method of putting received ideas, to justify its publication; but Mr. Bellars is neither forcible nor original. His chapter on architecture, for instance, is little more than Ruskin-and-water. Still, it is what may be termed a "pretty book," and, as artistic light reading, may prove attractive.

Time and Time-Tellers. By JAMES W. BENSON. London: Robert Hardwicke, Piccadilly.

MR. BENSON has made his little volume both instructive and entertaining. After a pleasant and somewhat minute history of clocks and watches, as well as of the earlier time-tellers, he treats of modern watches, escapement to watches, balances, clock-escapements, and, at more length, of turret clocks, with which a considerable section of our readers are more particularly concerned.

It is estimated, many will be surprised to hear, that the manufacture of and trade in watches annually in England, France, Switzerland, and America, amount to over 5,000,000*l*. per annum; and that in Switzerland alone there are 38,000 persons, one-third of whom are women, engaged in the manufacture. It is probable, Mr. Benson thinks, that even the immense number of new watches thus annually produced barely exceeds the growing requirements of the people, who, as they increase in intelligence and receive higher wages, soon learn the advantage of personally possessing a pocket time-keeper, and make it accordingly their first ambition to purchase one. The Watch clubs which are formed in the various towns and rural districts throughout the kingdom enable this desire to be gratified at but small pecuniary inconvenience, inasmuch as payment is thus made in small instalments at fixed intervals, and the watch is bought with sums which might have been spent thoughtlessly and to no permanent benefit. This first lesson in thrift having been well learnt, and the result being so palpably beneficial to those who exercise it, has often laid the basis of a regular habit of economy.

The remarkable position which Mr. Benson has attained in his trade has made his name so well known that few will be able to believe that the author of "Time and Time-tellers" had not a personal object in its publication, and doubtless they are right. This object, however, is so entirely kept out of sight that it can only be guessed at, and will in no way interfere with the pleasure and profit with which the book may be read.

VARIORUM.

IN a pamphlet entitled "The Piece-work Question in Engineers and Ironfounders' Shops," the Iron Trades Employers' Association have published the correspondence on the strike against Messrs. Easton & Anderson, and some of the articles bearing on it, which have appeared in newspapers.——"The British Almanac and Companion" for 1876 includes a chapter, as usual with its predecessors, on Architecture and Public Improvements, and one on the Picture Exhibitions of the past year. The writer of the first perpetuates the mistake which attributes the New Town-hall at Leeds to Mr. Waterhouse.——The *Engineer* is giving full accounts, illustrated, of "Blackfriars Bridges, Past and Present."——The *World* says:—"Our principal art-collectors are, I hear, very chary of parting with the treasures of their galleries for the Philadelphia Exhibition. Two or three smaller Landseers and Mr. Frith's 'Railway Station' are the only modern works of any celebrity which have been promised." A considerable number of pictures, not quite so modern, will nevertheless be sent, we are told.

Miscellanea.

New Bank at Worcester.—New premises for the Stourbridge and Kidderminster Banking Company are approaching completion, in Broad-street, Worcester. The building is French Renaissance in style, and is a symmetrical composition of a centre and two slightly-projecting wings, one containing the principal entrance to the bank, and the other leading through a passage lined with white glazed bricks to the private entrance for the manager, and communicating with Angel-street in the rear. The pavement to the public portion of the bank is of marble mosaic, executed by Italian workmen; and the chimney-piece, 15 in. in height, is composed of Italian griotte, dove, veined, and other rich marbles. It was specially designed for the purpose by the architect, and has been executed by Messrs. Burke & Co., of London. The strong-rooms are solidly built upon a thick bed of concrete, lined with fire-clay, and fitted with Messrs. Milner's fire-resisting iron doors and ventilating gates. The whole of the basement and ground-floors are of fireproof construction. The principal front is built entirely in selected Bath stone, the carving being executed by Messrs. Farmer & Brindley, of London; Messrs. Richardson & Ellson, and Messrs. Skidmore, supplying the ornamental ironwork. Owing to the ruinous condition of the adjoining property, it became necessary to rebuild the house adjacent to the bank, which has been carried out in a similar style. The cost of the entire block will amount to about 8,000*l.*, Messrs. Wood & Sons, Worcester, being the contractors; Mr. Jeffreys, the clerk of the works; and Mr. H. L. Florence, of London, the architect.

Repairing Cracked Bells.—A correspondent of the *Scientific American* proposes that cracked bells should be repaired as locomotive cylinders are sometimes repaired in the United States. A piece is slotted out by a machine, and the surface is scraped perfectly true; then a pattern is made, and a casting in bell-metal is made from it. This piece is planed and scraped to fit perfectly into the slot. This is done with the same nicety as making a patch for the broken locomotive cylinder. To fasten it in its place an oven is constructed with a door large enough to admit the bell. The bell will stand upside down on an iron truck, with a wheel under it, so that it can be put in and taken out of the oven conveniently. The oven must be heated by a clear fire, free from smoke, and the flames are not to touch the bell. The bell and the piece are to be put into the oven, and the door closed, till they become hot enough to melt silver solder. Then remove the bell and piece from the oven, and treat the sides of the crack and piece with muriatic acid, prepared as silversmiths' acid for soldering. Then coat the sides of the crack and piece with silver solder. Do this part expeditiously, and free the surface from dross; then, while the bell is hot, and the solder is in a soft adhesive state, insert the piece in its place. Have at hand two large pieces of iron, shaped like the inside and outside of the bell, red hot, with suitable tongs for holding them. These are to be used to keep up the heat if necessity requires it. When the soldering is completed, allow the bell to cool off.

Restorations and Improvements at Eton College.—During the recess considerable progress has been made in the works at the new mathematical schools, which are being built on the north side of the college, near the Slough-road. The new building is in the Mediæval style, and is being constructed of red brick with Bath and Portland stone dressings, so as to match the earlier portions of the college buildings. The erection is 152 ft. long, 43 ft. high, and 44 ft. in breadth, and consists of an arcade, and upper and lower stories. Altogether there are sixteen class-rooms, eight on each floor. All will have oak moulded and panelled ceilings, with an oak panelled dado, 7 ft. high, along the lower part of the walls. The rostra, benches, and desks are likewise of oak. When finished, the new mathematical schools will be capable of seating upwards of 500 pupils. The total cost will be about 15,000*l.* Mr. Woodyer is the architect, the contractors being Messrs. Wheeler, Brothers, of Reading.

The Defence of London.—The Royal Engineers have for some time past been engaged in making surveys of the country around London with a view of some more definite steps being taken for the defence of the metropolis.

Proposed New Cemetery for Wimbledon. At a meeting of the Wimbledon Local Board on the 19th inst. the clerk read a report from the drainage committee, recommending that the plans for the cemetery, chapels, and grounds be so modified as to allow of the buildings being constructed at a cost not exceeding 4,000*l.*, and the forming and laying out of the grounds, &c., for 2,000*l.* A report was also read from the cemetery committee, recommending important alterations in the plans, including the curtailment of the length of the chapels by 5 ft., with the view of largely reducing the cost of the work. A third report was presented by the surveyor (Mr. Rowell), showing how a reduction of 3,686*l.* in the estimates before them might be effected. In the course of the discussion it was stated that the lowest tender received for the buildings alone amounted to about 8,700*l.*, while the total amount available for the whole work was only about 6,500*l.* A member of the Board suggested that a number (!) of architects be invited to furnish plans for the two chapels, mortuary, and lodge, independently of the enclosure and laying out of the ground. If such were done he had not the least doubt that some clever architect would be found to prepare plans which would ensure the erection of the buildings for 4,000*l.* It was resolved to adopt the suggestion.

New Cemetery for Canterbury.—A meeting of the Canterbury Burial Board was held on the 19th inst. to consider the plans prepared by the surveyor for the new cemetery. The surveyor produced his estimate, which was as follows:—Chapel complete, 2,324*l.*; cottage complete, 565*l.* 5s.; mortuary and hearse-house, 216*l.*; roads and paths in cemetery, 732*l.* 4s.; fencing from point abutting on new road with wire fencing on the north, east, and west sides, 1,022*l.*; new road leading to cemetery, planting ditto with trees, and asphalting paths on each side, 1,038*l.* 9s.; cost of land, 2,400*l.*; planting, 150*l.*; excavating on north-east and west side, 50*l.*; incidental compensation, architects' and other charges, 300*l.*; total, 8,797*l.* 18s.; deduct sum given by commissioners for road, 300*l.*; 8,497*l.* 18s. In reply to Alderman Austin, Mr. Wright said his estimate amounted to about 8,000*l.* After some discussion the plans were adopted.

Worcester Guildhall.—The committee of the Worcester Town Council (consisting of the Survey, Buildings, and Property Committee, with the addition of the chairmen of the other committees), to which the question of the rebuilding of the Guildhall was referred, had a meeting on the 19th inst., and a long sitting terminated without their coming, so far as the Worcester papers are aware, to any definite conclusion. It is said to have been proposed that Mr. Waterhouse's design should be adopted, but this found no seconder. It was also proposed and seconded, that the Council be recommended to abandon Mr. Waterhouse's plan on the ground of expense, but this was lost by a majority of one. All that was decided was about tantamount to this,—that the edifice should be rebuilt when the Council can be brought to appropriate sufficient funds for the purpose.

Fall of Buildings in Newcastle. — An alarming accident has occurred in Newcastle. An apparently substantial building situate in Westgate-road, one of the leading thoroughfares in the town, together with the adjoining works of Messrs. H. Angus & Co., coach-builders, suddenly gave way and fell to the ground. It appears that for some time past the first has been undergoing extensive alterations, the front of the building having been almost entirely removed to be rebuilt. Signs of shrinking had been noticed, but no idea was entertained that the fabric was so unsafe as it has proved to be. Messrs. Angus's workmen had not long been at work after the dinner-hour when the building next door went down with a crash, and the front premises of the coach-works, from the first-floor upwards, also collapsed.

Local Taxation.—The total sum raised in England during the year 1873–4 by local taxation properly so called was 24,295,133*l.* The sum levied by rates falling on rateable property amounted to 19,821,203*l.*; levied by tolls, dues, and rents falling on traffic, 4,118,890*l.*, and levied by duties falling on consumable articles, 355,034*l.* The gross estimated rental of the whole of the rateable property in England was 136,230,863*l.*, and the rateable value 115,492,013*l.*; so that the total amount charged on rates, viz., 56,065,062*l.*, was less than one-half of the annual rateable value of property in the country.

The Ordnance Survey.—We have already given currency to the announcement that the Government have ordered a reduction in the expenditure upon the Ordnance Survey. Writing to a daily contemporary, Mr. Thomas Sebastian Bazley says that the Government "might have selected a fitter object for a little cheeseparing. But an efficient survey of the country with the promised new 'Doomsday Book' (whose appearance is singularly delayed) will be essential to any improvement in land transfer or land registration. . . . . So far from diminishing the cost and extent of the survey, it should be largely increased. And, as it is of immense benefit to all proprietors to possess plans of indisputable accuracy, a proportion of the cost might fairly be recovered *pro rata* from the owners of the lands surveyed."

Brighton.—The value of stable property in Brighton is rapidly increasing. The Norfolk Hotel livery stables,—lately noticed in the *Builder* as having been rebuilt from designs and under the supervision of Mr. Edward H. Hudson, architect, of that town,—are to be transferred to a limited liability company, with a capital of 50,000*l.* In addition to the increasing livery and hunting stable business, there are to be periodical sales of horses, carriages, and harness, as at Tattersall's and Aldridge's in London. The premises provide accommodation for 200 horses, 100 carriages, and forty rooms for the grooms. The property is valued at 15,000*l.*, exclusive of stock and goodwill. Sir Cordy Burrows and Mr. Alderman Mayall are trustees.

Proposed Conference of Ironmasters.—An important national conference of ironmasters is convened to be held in London, during the latter part of February or beginning of March, for the purpose of considering various questions which are now looked upon as demanding the careful consideration of the trade. Wages in relation to foreign competition is one of these subjects, and will doubtless be seriously dealt with. It is expected that Mr. Clark, of Dowlais, will preside, and that every district will be very influentially represented. At Sheffield, large numbers of steel-workers and other workmen are being discharged, owing to the unparalleled stagnation of trade.

Crabs and Winches.—According to a recent invention by Messrs. Crossley, of Manchester, a sliding bar, by which the driving band of a winch is shifted from the fast to the loose pulley, is formed with an incline, which at the same time that the band is shifted on to the loose pulley is made to act on the break so as to stop the machine. On the side of the loose pulley is formed a rim, which can be made to bear upon the face of a disc, which is also in frictional contact with the periphery of the break wheel, and so arranged that when the band is on the loose pulley the break wheel, and with it the chain barrel, will be run in the direction for unwinding the chain.

Deck Loads of Timber Ships.—At a meeting of underwriters and shipowners in Newcastle-on-Tyne, on the 13th inst., to consider the practicability of abolishing the custom of deck-loading in timber-laden ships, the following resolution was passed:—"That the secretary be authorised to correspond with the Government, through the local members or otherwise, recommending that ships of British and foreign register carrying deck-loads of timber be prohibited from entering into ports of the United Kingdom at all seasons of the year, and to make such representations to other Governments as will enable them to carry out this resolution."

The late Mr. Gastineau, Artist.—On the 17th inst. died Mr. Henry Gastineau, aged 86, the well-known water-colour artist. He was the oldest member of the Society of Painters in Water Colours, and contributed a number of pictures to their last exhibition. A good many years have passed since the Conductor of this Journal, then a boy walking the Rhine and the Moselle with sketch-book and note-book, seeking in his small way to pick up what he could find, first met Mr. Gastineau labouring assiduously to transfer to paper picturesque scenes then less known than now. Mr. Gastineau loved his art, and has done good work.

Museum for Nottingham.—The plans of Messrs. Hine & Son for the adaptation of the Castle, Nottingham, to the purposes of a public Museum and Gallery of Art, have been unanimously adopted by the council. Tenders for the execution of the works are to be obtained forthwith.

Hawick Archæological Society.—On the 18th inst. the twentieth anniversary of this Society was celebrated by a supper and business meeting in the Museum. Mr. D. Watson, president, occupied the chair. Reports were given by the secretary (Mr. J. J. Vernon), and the treasurer (Mr. F. Hogg), showing that the Society is in a prosperous condition, and had done a considerable amount of work during the past year. The Rev. J. R. Dakers was chosen president; Sir W. Elliot, of Wolflee, and Bailie Michie, vice-presidents; Mr. F. Hogg, treasurer; and Mr. D. Watson, secretary.

Fire-blocks of Tan.—A firm in Treves, Germany, manufactures fire-bricks of refuse tan just as it is taken from the pits. They are made in a very simple manner, without special apparatus, and without being baked, and are said to almost equal the best stone-coal in flame, duration, and heating power. They appear to be nothing more nor less than dry tan saturated with gas-tar. They are very heavy, and when broken the fracture is a brilliant black. They burn at first with a bright flame, which gradually slackens, and at last they burn dead like coke.

A New Masonic Hall for Sheffield.—A meeting of the Sheffield Masonic Hall Company (Limited) was held at the Masonic Hall on the 21st inst., under the presidency of the chairman, Mr. Alexander Hay. The purpose for which the meeting was called was to consider the question of building a new hall. It was decided to pull down the present building, and erect another on its site. The new hall is to be brought up to the street boundary both in Surrey-street and Eyre-street. The estimated cost of the new building and site is 6,000*l.*

The Valuation of the Metropolis.—A great number of appeals arising from the operation of the Valuation (Metropolis) Act, 1869, are to be heard at the sittings of the Court of General Assessment at the Guildhall, Westminster, before Mr. P. H. Edlin, Q.C., assistant judge, and other members of the court, viz., Messrs. Pownall and Kemshead (Middlesex), Messrs. Penrhyn and Hardman (Surrey), Aldermen Finnis and Besley (city of London), and Admiral Robertson and Mr. Riley (Kent), on February 7 and subsequent days.

Costliness of Trees for Street Planting.—A committee of the Hackney District Board of Works having been instructed to consider and report on the question of planting trees at suitable places in the district, have presented a report to the Board, stating that as each tree would cost 5*l.*, independently of maintenance, they were reluctantly compelled to recommend the Board not to go on with the matter. Some discussion took place at the last meeting of the Board, and ultimately the subject was referred back to the committee.

Royal Birmingham Society of Artists. The season of the Royal Birmingham Society of Artists, just closed, is stated to have been a very successful one, 47,127 persons have visited the exhibition once, of which number 27,934 came during the second season, and at that time also 6,024 were admitted free by holding Art Union tickets. The sales are:—General sales, 4,931*l.* 18*s.*; Art Union sales, 922*l.* 12*s.*; total, 5,854*l.* 10*s.*, being an increase of 735*l.* 12*s.* over the season of 1874.

Yafforth, Northallerton.—Four panels carved in bas-relief in Caen stone have been placed in the reredos behind the communion-table in this church. The subjects are the Nativity, the Baptism, the Transfiguration, and the Resurrection of our Lord. The figures are carved with much skill. The panels are the gift of the Misses Masterman, of Little Danby; and the work, which has given entire satisfaction to the donors, has been executed by Messrs. J. Throp & Sons, sculptors, of Leeds.

Krupp's Non-Conducting Silicate Cotton. The value of this material as a cheap and effective non-conductor to all users of steam-power, safe-manufacturers, and others, must be considerable if it at all answers the purpose as well as the small portion which has been submitted to us. As the process seems to include the mechanical admixture of fine sand with the cotton, it may be as well to remember that a certain sort of motion would have the effect of liberating the sand.

Royal Academy of Arts.—At a general assembly of the academicians and associates, held on Wednesday evening, Messrs. E. Long and L. Alma-Tadema were elected associates.

Competition for Admission to the National Training School for Cookery.—The Society of Arts has established five scholarships, entitling the holders to free instruction in this school. These will be competed for on Saturday, the 12th of February, at ten a.m., at the school at South Kensington. Qualified teachers are now urgently wanted for schools, and when they have obtained their diploma, they may earn from 1*l.* to 2*l.* weekly. Every member of the Society of Arts is privileged to nominate one candidate.

Switzerland.—The Swiss Society of Engineers and Architects, and that of the past scholars of the Polytechnic School, having made *Die Eisenbahn*, otherwise *Le Chemin de Fer*, their organ of publication, the managers are enlarging their programme, and intend devoting more space to architecture and the science of construction than they have done. Some of the articles are in French, others in German. It is published in Zurich.

A New Railway in India.—The construction of the railway between Agra and Gwalior is to be begun without delay. The Government of India have advertised for tenders for the construction of the whole line, a distance of seventy-five miles, including the bridge over the river Chumbal. This line will be another link in the chain of railways that in course of time will run through Central India and Rajpootana to Bombay.

Salaries at the Metropolitan Board of Works.—At the meeting of the Metropolitan Board of Works, on the 21st inst., the following increases of salary were made:—Mr. Wakefield, the clerk of the Board, from 700*l.* to 800*l.*; Mr. W. W. Smith, the solicitor, from 1,400*l.* to 1,500*l.*; Mr. Vulliamy, the superintending architect, from 1,400*l.* to 1,500*l.*; and Mr. Gunn, the accountant, from 700*l.* to 800*l.*

The Water of Leith Bridge, Edinburgh. At a meeting of the Edinburgh Road Trust on the 17th inst., there were submitted plans of a scheme which has been mooted for raising the Water of Leith Bridge at Bell's Mills by 20 ft., so as to improve the gradient of the roadways. It was stated that the proposed improvement would cost some 5,600*l.* The matter was remitted to a committee for consideration.

Masons' Wages at Dysart.—For some time past considerable excitement has existed at Dysart, in connexion with the threatened strike of operative masons, the master builders having signified their intention of making a reduction of ½d. per hour on wages. On the 15th inst., however, the master builders agreed to let the matter drop, and allow the same rate of wages as formerly,—8½d. per hour.

Cement for Iron.—The following is an iron cement which is stated to be unaffected by red heat. Four parts by weight iron filings, two parts clay, one part fragments of a Hessian crucible; reduce to the size of rape seed and mix together, working the whole into a stiff paste with a saturated solution of salt. A piece of firebrick can be used instead of the Hessian crucible.

Clapham Common.—On the 18th inst. many of the additional improvements on Clapham-common were completed, and the Metropolitan Board of Works, who rescued this suburban manor land from speculative builders by purchasing the manorial rights at a cost of 17,000*l.*, will not enclose any portion of the common, but preserve it as an open park for the public.

Strike of Painters at Durham.—On the 17th inst. the Durham house-painters struck work, on account of an intimation from some of the employers of an intended reduction in the rate of wages. The intention is to reduce the men a penny per hour, which would cause an abatement in the wages from 31*s.* 10*d.* to 25*s.* per week. The men refuse to accept this.

Slow Combustion Grates.—Amongst such may be mentioned those by Messrs. Clark, Hunt, & Co., of Shoreditch. The grate is so constructed that when placed in the brick recess it forms a chamber at back for warming and circulating air in the room; and as the fire burns on a solid fire-brick, the consumption of fuel is doubtless less than in register stoves of the ordinary construction.

Sir George Harvey, late president of the Royal Scottish Academy, died on the 22nd inst. at Edinburgh.

The Royal Academy Medal.—The Council of the Academy have determined, we believe, not to reverse their decision as to the recent award of the medal for architecture. It is not disguised that a mistake was committed, and arrangements have, we understand, been made with a view to prevent on any future occasion the adoption of drawings not in accordance with the published conditions.

Proposed Winter Garden, Bradford.—A meeting was held at Bradford, on the 18th inst., in furtherance of a projected scheme for establishing a winter garden, aquarium, skating-rink, and assembly-room, with the object of providing rational entertainment for the inhabitants of the town. It is proposed to purchase about 5,200 yards of land fronting Manningham-lane. Mr. Mawson is the architect.

Hogg's Patent Sanitary Ventilating Company.—This company is formed for the purpose of purchasing and working a patent taken out by Mr. Hogg, through which pure air is secured by efflux, or the riddance of vitiated air, by process of vacuity or exhaustion; and influx, or the induction of the outer air, delivered in vertical air columns.

Mexican Onyx Marble.—This is a very beautiful material for internal decoration, and its price is sufficiently reasonable to give hope that it may be largely introduced. Mr. B. La' Mert, who acts as agent for Great Britain, has shown us some very charming specimens. It includes a considerable variety of colours, and ought to considerably used.

The Langham Rink Club.—"The cry is still, they come." Our advertising columns show that it is proposed to transform the Portland Bazaar, Regent-street, and some adjoining property, into a skating-rink and clubhouse. The area will be large, and will afford good accommodation. A long list of names is given as forming the council of the club.

St. James's Park.—A correspondent asks us to call the attention of the First Commissioner of Works to the disgraceful state of the asphalte footway, in St. James's Park, that runs between the triangular enclosed grass-plot and the houses in Spring-gardens. The footway is full of holes, and therefore most dangerous to pedestrians by night.

Resignation of the Weymouth Borough Surveyor.—Mr. George Seaman has resigned his position as borough surveyor of Weymouth. From a letter read at the meeting of the town council on the 21st inst., it appears that Mr. Seaman feels that he has been unfairly blamed in reference to works carried out under the advice of other persons.

The Proposed Fever Hospital at Sheffield.—The Health Committee of the Sheffield Town Council, at their meeting on the 20th inst., discussed the question of providing a fever hospital for the town, as suggested at the previous meeting of the Council. A sub-committee was appointed to look out for a site.

Skating Rink for Bournemouth.—The skating rink in the Bournemouth Winter Garden Company's grounds has just been opened. The rink is 105 ft. by 50 ft., and has been constructed by Messrs. Fletcher, Lowndes, & Co., of Great George-street, Westminster, with cement floor.

The Removal of Snow.—At a meeting of the St. Olave's (Southwark) District Board of Works, on the 18th inst., a letter was read from the Conservators of the Thames giving the Board authority to throw clean snow into the Thames on the occasion of heavy falls.

The late Mr. Bridgman.—We are informed it was the third premium in the Paddington Baths competition that was awarded to Mr. Bridgman, not the second; the second went to Mr. H. H. Collins.

Wigan.—A new Presbyterian church is about to be erected in Wigan. The church will accommodate 600 persons, and cost 3,000*l.* The architect is Mr. G. F. Stalker, of London.

TENDERS

For drainage works, for the borough of Deal, at North End:—

Prout	£5,260 0 0
Hobbs	4,000 0 0
Croxford	3,910 0 0
Homes	3,755 0 0
Ansell	3,584 0 0
Chamberlain	3,549 0 0
Bourne	3,490 0 0
Denne	3,475 0 0
Coleman	2,910 0 0
Ritson	2,887 0 0

For the erection of a block of model dwellings, in the London-road, Enfield. Mr. Thomas J. Hill, architect:—

Linzell	£2,793	0	0
Rist & Brown	2,763	0	0
Field & Sons	2,750	0	0
Patman, Brothers	2,748	0	0
Bentley	2,370	0	0
Sabey & Son	2,320	0	0
Fairhead	2,250	0	0

For the erection of a warehouse, at 20, Old Change. Mr. Tabberer, architect:—
Crabb, accepted.

For new vicarage, stables, and boundary-walls, for St. Mary Abbotts, Kensington. Mr. W. White, architect. Quantities by Mr. John Young:—

Carter	£6,065	0	0
Downs & Co.	5,630	0	0
Gregory	5,435	0	0
Lathey, Brothers	5,403	0	0

For the erection of warehouse and offices, 51 and 53, Knightrider-street. Mr. J. W. Reid, architect:—

Hill, Higgs, & Hill	£8,100	0	0
Kirk & Randall	7,627	0	0
Nightingale	7,360	0	0
Downs & Co.	7,218	0	0
Ramage	7,200	0	0
Scrivener & White	7,142	0	0
Bayes, Bros., & Allen (accd.)	6,718	0	0

For the erection of two-story stabling, Church-street, Chelsea, for the London General Omnibus Company, Limited. Mr. P. Tosh, architect. Quantities by Mr. A. J. Bolton:—

		Allow for Old Material.
Young & Co.	£3,953	£56
Brass & Co.	3,911	100
Martin, Wells, & Co.	3,899	150
Garland & Perkins	3,784	147
Stephenson	3,722	110
Crabb	3,709	120
Gold & Brand	3,555	80
Read & Roberts	3,497	185
Cohen	3,478	53
Shorn & Co.	3,467	80
Perkins	3,383	133
Aitchison & Walker	3,333	86
Forkington	3,317	100
Niblett & Son	3,295	85
Braid & Co.	3,149	66
Beale	3,156	204
Hunt	3,130	137

For ironwork in patent fireproof flooring for the above. Mr. P. Tosh, engineer. Quantities by Mr. A. J. Bolton:—

Stephens & Co.	£1,942	0	0
Hall	1,790	0	0
Oswald, Gardner, & Co.	1,759	0	0
Horsely Iron Co.	1,665	0	0
Butterly Iron Co.	1,508	14	5
Bunnet & Co.	1,462	0	0
Goodenough	1,420	0	0
Shaw & Co.	1,347	0	0
Head, Williams, & Co.	1,340	0	0
Jukes, Coulson, & Co.	1,316	0	0
Measures, Bros.	1,287	10	0
Witford & Co.	1,280	0	0
Brass & Co.	1,270	0	0
Young & Co.	1,260	14	0
Bergheim	1,204	13	7

For new chancel, organ-chamber, vestry, &c., to the Church of St. James Norland, Notting-hill. Mr. R. J. Withers, architect. Quantities prepared by Mr. Charles Poland:—

Booth	£2,476	0	0
Sharpington & Cole	2,363	0	0
Browne & Robinson	2,350	0	0
Dove, Bros.	2,275	0	0
Lawrence	2,247	0	0
Cowland	2,190	0	0
Newman & Mann	2,132	0	0

For rebuilding Gun-street Mills, Spitalfields, for Mr. T. B. Haslam. Mr. R. P. Notley, architect. Quantities prepared by Messrs. Frankland & Andrews:—

Oliver	£2,280	0	0
Newman & Mann	2,096	0	0
Scrivener & White	1,963	0	0
Hart	1,955	0	0
Greenwood & Sons	1,954	0	0
Marsland	1,950	0	0
Browne & Robinson	1,908	0	0
Morter	1,897	0	0
Shepherd	1,862	0	0
Killby	1,686	0	0

For proposed alterations, &c., at the Edinburgh Castle, Caledonian-road, for Mr. C. Howland. Messrs. Bird & Walters, architects. Quantities supplied by the architects:—

Ennor	£786	0	0
Newman & Mann	740	0	0
Kerry	728	0	0
Williams & Son	713	0	0
Brown	676	0	0
Anley	655	0	0

Vicarage, South Acton.—Mr. Nye's tender has been accepted.

TO CORRESPONDENTS.

J. L.—G. B. L.—E. R. R.—J. T.—T. C.—A Traveller.—J. W.—J. K. C.—S. H.—W. S.—J. C.—H. G.—J. P. M.—H. J. S.—T. J. H.—J. M. G.—S. & T.—J. H.—T. C. H.—T. O.—E. W. H.—G. F. S.—E. C.—H. R. W.—T. E.—G. C.—M. & M.—Mr. C.—E. M. jun.—A. Z. (no).—P. P. C. (next week).

We are compelled to decline pointing out books and giving addresses.

All statements of facts, lists of tenders, &c. must be accompanied by the name and address of the sender, not necessarily for publication.

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HENRY BLAKE, Principal Clerk.
Sewers Office, Guildhall, 11th January, 1876.

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